The Builder.

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The Church of St. Germans, Cornwall.

THERE is no church in Cornwall that can compare with that of St. Germans in the richness of its historical and ecclesiological associations; and there are few, if any, that can rival the interest and variety of its architecture or the beauty of its situation.

In order to understand the nature of the fabric that now survives of a church that was at once conventual and parochial, it is imperative that a bare outline of its history should be given.

In the earliest pre-Norman period of its existence the church of St. Germans was a collegiate foundation, served by a community of secular clergy or canons. It was founded in honour of St. German, who became Bishop of Auxerre, in France, in the year 425. He came over into Britain to oppose the Pelagian heresy, and his fame as a defender of the orthodox faith is still kept green. He travelled throughout England, Wales, and Scotland. Bishop German has left traces of his active missionary work on the maps of both Great Britain and the Continent, but nowhere with greater emphasis than on this widespread parish of south-east Cornwall. There seems no reason to doubt that the tradition of his having made this place a centre of his west country preaching rests on a sound foundation.

Whether there was any earlier establishment of a bishopric for Cornwall than that which is known to have a historical existence in the IXth century is a matter of some doubt; but that St. Germans was the seat of the see of Cornwall at that period is an ascertained fact. Conan was bishop here in 931, and his sixth successor in the bishopric of St. Germans was Lyfing, who died in 1046. After that date Cornwall became united with the see of Devon, and remained so to our own times. A body of canons held half of the large parish of St. Germans at the time of the Domesday Survey in 1087. Of the church that they served, which was doubtless of considerable size, no part is still standing, so thorough was the rebuilding in Norman days. It is generally said that there are certainly no traces of it left above-ground. But this is not quite correct. In two or three places in the interior of the present church hewn stones have been noticed dressed in the pre-Norman manner, after a chevron fashion, which speak plainly of the subsequent use of Saxon material. Moreover, various squared stones dislodged during repairs of the current year (1904) showed clear traces of mortar adhering of an earlier date than when again placed in position by Norman masons. So that the skilled antiquarian eye would feel confidence as to the existence of a stone pre-Norman fabric on this site apart from all records.

The canons continued to serve this church until the episcopate of Bishop Bartholomew, of Exeter (1161-1184), in whose days they were suppressed for irregular life and worldliness. The Bishop, in a charter yet extant, converted this church and its adjacent collegiate buildings into a priory of canons-regular of the order of St. Augustine. The Bishop died in 1184, before the transference to the Austin canons was fully completed, but we know that it was accomplished before the year 1190.

The new prior and his canons were not likely to be content with the old church and buildings, which were probably by that time, owing to the careless life of their predecessors, in considerable decay. From the genuine though late Norman character of much of the work now remaining at St. Germans, it is obvious that energetic rebuilding must have been at once undertaken by the new establishment.

The fabric of the church as it now stands consists of chancel and nave (in continuous line), south aisle, a quasi north transept and chapel, south-west porch, and two western towers. The interior length of the nave and chancel is 102 ft., and its width 23 ft. The south aisle is 25 ft. wide, narrowing by about 5 ft. in the two most eastern bays, that are level with the quasi-chancel. The interior width at the west end between the two towers is 61 ft.

Interesting and beautiful as are the remains of what must once have been a remarkably fine late Norman church, it is sad to think how much it has suffered, not only at the time of the dissolution of the monasteries, but even within the last hundred years.

In the Cornwall volume, of "Beauties

of England," published in 1801, the north aisle is described as "divided from the nave by five short, thick, round columns, each connected with a half-pillar opposite to it in the north wall by a low surbased arch; all the capitals of the columns are square, and curiously ornamented with Saxon (*i.e.*, Norman) sculpture. . . . Above these range six plain arches, some of them apparently of the same age and style with those in the nave of St. Alban's Abbey Church, Hertfordshire." Two years after this account was published the north side of the nave was said to be in a perilous condition, and so, to save the expense of proper repair, the whole of this good Norman arcade work and vaulted north aisle were swept away and the present north wall of the nave run up in its place. Parts of the piers and other Norman moulded fragments can be detected in the masonry. The traces at the west end of the present south aisle show conclusively that the nave aisle on that side of the church exactly corresponded with the north aisle. A paper of the Exeter Diocesan Architectural Society, read in 1848, mentions that at that date the lines of the lean-to roofs of both aisles could be clearly seen on the eastern faces of both the towers. Some singularly fine Norman clearstory windows, of considerable size and richly ornamented with zigzag mouldings, have been recently brought to light, during a repointing scheme, above the western part of the south arcade, two pillars and a respond of which are still of the original Norman design.

Careful examination seems to show that the Norman scheme was a nave of five bays, for parochial use (exclusive of the western bay between the two engaged towers), the most eastern bay being intended for the beginning of the conventual quire when the time came for rebuilding the Saxon chancel. There is no trace left of any transepts, which were probably left for later development; and a substantial screen would at that time cut off the parochial nave—necessarily large for the largest parish in Cornwall—from the canon's quire at the first piers from the east end of the new Norman structure.

The west front of the nave between the two towers and the basements of the two towers are of late but definite Norman work. Below the central gable are three large Norman lights, the one in the middle being the highest. Below these are two smaller lights, the inner angles of the bases of which are cut off by the steep-pitched roof of the projecting western doorway or portico, thus substantiating the idea that this singularly fine and enriched doorway was an afterthought, or, at all events, executed at a slightly later date. The width of this noble portico is 20 ft.; the actual door space is but 6 ft., and the remainder is occupied by the four shafts, alternating with zigzag or chevron mouldings. The arch is of seven orders; the two innermost are merely round, the third and fourth have the zigzag ornament, the fifth is rounded, and the sixth and seventh are also sculptured with the zigzag. The height of the doorway is 10 ft., and of the whole archway 16 ft. The outer arch is surmounted by a hood-mould having head terminals, and much enriched with foliage, etc. Above the arch is a pediment surmounted by a four-nosed cross. The erection of the towers that flank this western portal was not continued until the Transition from the Norman was in vogue, *circa* 1200, and one of them seems to have remained uncompleted for some time.

Though there was no interference with the actual nave of the church in the Early English or First Pointed style, it is known from the remains still to be seen in the interior of the Earl of St. Germans' house, to the immediate south of the church, that the cloisters and refectory of the conventual buildings were rebuilt in the time of Henry III.

The towers are somewhat puzzling. Probably the two lower stages of each were finished about the same Transition date. This level is about the same as that of the nave roof, and here they most likely ended, being crowned with pyramidal tops. The additional octagonal story of the north-west tower has plain pointed lancets on each face, and clearly points to Early English work, probably about 1250-60, and, if so, of the like date with the rebuilding of the quire. The embattled summit is, of course, of later date, and the upper masonry shows pretty clear traces of having been then somewhat raised. The south-west tower is distinctly Norman in its basement stage, but the remainder has been a good deal altered as well as raised at later dates. The arches under these towers, opening into the church to the east and on each side, are quite plain and supported on bold, clustered columns.

On the south side of the nave, at the west end, are the two remaining Norman piers, short, circular, and with cushioned capitals; but they now support pointed arches.

An entry in Bishop Bronescombe's register at Exeter states that he dedicated the conventual church (*conventualem ecclesiam*) of St. Germans on August 28, 1261. It is quite clear that this means that a new and extended quire for the canons was at that date consecrated. The nave of a church might be altered and extended, or new chapels added to a chancel, without any episcopal dedication being required, but when the site of the high altar was changed canonical law made fresh consecration obligatory.

The comparatively narrow Norman aisle on the south side of the nave was taken down at two different periods for the purpose of enlargement. The town of St. Germans stood on the south side of the church, whilst the conventual buildings were on the north side, the north aisle of the nave forming one side of the canons' cloister. The Bishops of Exeter had a residence not far from the priory, several families of distinction had manor and other houses in this widespread parish in the XIVth century, and greater church accommodation became necessary. The first alteration was the substitution of a south chapel 22 ft. wide in the three eastern bays of the 10-ft. wide Norman south aisle. This chapel, still very beautiful, must have been of singular perfection when first built. The east end is most unusual. There are two three-light windows with excellent though slightly different tracery, and between them is a handsome recess for a life-size image, with crocketed canopy. There is a third two-light smaller pointed window high up in the apex of this east wall; but we know from Whitaker's history of this church, published in 1804, that it is comparatively modern, having been constructed by Lord Eliot, a little before Whitaker's time, from remains found in the quire ruins. On the south side of this chapel one of the original windows remains, the window to the east of it having been destroyed to make room for the great costly group of marble sculpture by Rysbraeck, with the effigies of Edward Eliot, 1722, and his two wives, which now stands under the north-west tower. There is a single sedile of fine and perfect design to the south of the altar, and when the cumbersome marble monument was removed a lofty canopied recess was found under an ogee arch. The work of this recess had been cruelly hacked away to make room for the cumbersome monument, but enough remains to show that it was originally of exquisite workmanship.

Where work of such exceptional beauty is found, it becomes at once highly probable that there was some additional reason for the construction of such a chapel other than that of greater space. The annals of the church at once supply the cause in a remarkable incident that exactly corresponds with the period that architectural experts would assign to this chapel.

On the death of Prior Polgoner in 1355, John Precheur, the sub-prior, succeeded as superior. During his rule the priory became enriched with relics of the Saint whose name it bore. Sir Nicholas Tamorze, Kt., succeeded in obtaining from the abbot and convent of St. Germain of Auxerre a portion of the relics they possessed. A small bone of the arm and a portion of the shroud in which the body of St. German rested were given to the knight, who placed them in a silver-gilt reliquary and brought them across the seas to Bishop Grandisson, by whom they were conveyed to the priory of St. Germans, where provision had been made for their honourable keeping. The grant from the Abbey was made in March, 1358. On May 20, 1361, the Bishop granted a forty days' indulgence to all penitents who should make a pilgrimage to the shrine at St. Germans, or visit it at any time for the sake of devotion. There can be no reasonable doubt that this chapel was built at this period for the special reception of these relics, and that an aumbry for their safe enclosure was placed within the canopied recess to the south of the altar. The image niche between the two windows would doubtless hold a statue of St. German. This niche has quite recently been filled with a statue of Our Lord as the Good Shepherd. If it was to be filled, it seems a pity that a figure of the great missionary Saint was not once again placed in the position designed to perpetuate his memory.

About a century later the western end of this chapel, which projected beyond the rest of the narrow aisle, was taken down and a wide south aisle was continued right up to the south-west tower, and four four-light large pointed windows

inserted in the south wall, one in each bay. The upper tracery of the three easternmost of these windows, though slightly different in each case, is of the kind known as fairly advanced "Perpendicular"; but the one nearest the tower has reticulated tracery and would generally be termed "Decorated." There is no necessity, however, to state that therefore the work of widening the whole aisle began at the west end, and was there interrupted for "at least fifty years." Close examination of the general masonry and of the jambs and hood-moulds, etc., shows that the work is all of the same date. One style was never quite driven out at a given date by its successor, and quatrefoil tracery not infrequently lingered on side by side with the later stiffer treatment well on into the XVth century. This is a fact which can not infrequently be proved in Norfolk churches. The terminals of the hood-moulds of these windows all bear heraldic and other devices. The arms of Bishop Lacy (1420-1450) are plainly discernible, and this yields the date of this effective aisle widening.

When the Norman aisle was thus widened, a south doorway in its western bay was taken out, and preserved as the west doorway at the end of the aisle. At the same time a charming little porch with an elaborately groined roof was built against the south wall of the south tower, forming a covered entrance to the aisle. This portico has doorways both on the south side and at its west end. The latter is a heavy doorway with spandrels, *circa* 1500. Of the same date is the blocked-up doorway under the easternmost window of the widened aisle. When the St. German relics chapel was erected in the XIVth century it would certainly have its own doorway in the projecting part of its western wall; and when the time came for the extension of the whole aisle a doorway would be transferred to the south wall. Such a doorway would doubtless be much used by pilgrims to the shrine—there would be crowds on the two festival days of St. German, July 31, his death day, and October 1, his translation; it seems to have been rebuilt on a wider scale, *circa* 1500, together with the west doorway of the porch. The pilgrims would enter by one of these doorways and depart through the other. It must not be supposed that the south aisle was the site of the parish altar; this would almost certainly be at the east end of the nave, and the ordinary parish entrance would be through the main west doorway. The year 1500 is said to be the exact date when the nave was re-roofed.

After the priory was dissolved, in 1539, the quire of the canons naturally fell into decay. The Champernowne family, to whom Henry VIII. granted the priory, used much of the walls in their adaption of the conventual buildings as a residence, and they actually built up a brew-house on the site of the high altar. This brew-house was standing in 1804, when Whitaker took some measurements. He found that the quire was the same width as the nave and extended eastward 55 ft. The parishioners, in adapting the nave for their use when the canons had gone, happily decided to move the great window from the east end of the quire to a like position at the east end of the nave. It is a fine five-light window measuring about 35 ft. high by 20 ft. broad, and has a transom. The upper tracery forms a kind of crown. It clearly dates from the dawn of the Perpendicular period, and may safely be assigned to the reign of Richard II.

Carew, in his "Survey of Cornwall," printed in 1602, says of St. Germans Church:—"A great part of whose chauncell, anno 1592, fel suddenly downe, upon a Friday, very shortly after public service was ended, which hevenly favour, of so little respite, saved many persons lives, with whom immediately before it had been stuffed: and the devout charges of the well-disposed parishioners quickly repayred this ruine." This often-cited statement has been hastily assumed to mean the downfall of the conventual quire; but it means nothing of the kind. We happen to know that the old quire was stripped of its lead almost immediately after the surrender of 1539, when the owners saw fit to turn much of it into a brew-house. That which fell in 1592 would be parts of the roof and very likely of the east wall of the nave that had been too hastily built up by the parishioners some fifty years previously to make themselves a chancel. When the north aisle was cleared away, in 1803, the scheme included the building of a kind of chapel or north transept for the Port Eliot pew, with a corridor leading to it. This pew has since been turned into an organ chamber, and the corridor into a vestry.

Considerable restoration schemes were carried out, at a large outlay, under the late Mr. Piers St. Aubyn, between 1887 and 1897. Repointing of the interior and many general repairs have been executed during the current year (1904). During the work a blocked-up niche for a holy-water stoup and a piscina niche have been uncovered in the south aisle.

The most interesting detail of the interior is the fine late Norman font, which was broken up and discarded in 1793. The fragments were, however, replaced and found to be almost perfect in 1840. The font is 33 in. square, and stands 39 in. high, and is of dark marble. In the four angles round the bowl at the top of the font are three three-leaved ornaments in slight relief and a circle or ring in the fourth angle. The north side of the bowl is carved with a round-headed arcade, and the other sides have much-worn patterns; it stands on a central and four subsidiary shafts.

In the south aisle is a small, somewhat rudely-carved miserere stall or seat, which has been clumsily repaired. A good deal has been written and said about "the extraordinary antiquity" of this piece of church furniture, and one antiquary of recent times has described it as "a penitential sedile with a carved record of the trespass thereon." The misericorde itself is carved with the figure of a sportsman carrying a couple of rabbits and surrounded by dogs. The subject is locally known as "Dando and his dogs," as to whom there are some amusing childish tales. But, after all, the date of this carving cannot be older than late XIVth century, and hunting subjects are quite common in such positions. It is quite clear that it originally formed one of a set of small stalls.

Another interesting fragment is a piece of the XVth century rood screen. Part of the stairway to this screen may now be noticed in the south aisle.

There is some beautiful modern glass of Burne-Jones design and Morris execution in the large east window, and other fine figures in the debased six-light window of the south chapel.

The large west doors have recently been ornamented, with very questionable taste, by Byzantine-looking patches of bronze work and a great closing ring of like style. The metal workmanship looks to be well done, but is quite out of keeping in such a place. Moreover, the would-be hinges are mere shams, and have no connexion with the eyes of the staples.

Much money and care has evidently been spent on this interesting fabric during recent years, but the strongly-marked new pointing of the interior can scarcely be regarded as an improvement. The ivy needs to be speedily checked on the north-west tower.

Considering the number of old families that were for so long a period settled in this wide parish, the church is singularly barren of monuments of special note or antiquity. The oldest that bears any inscription is to the memory of John Glanville, second son of Nicholas Glanville, an ancient family long resident at Tavistock. The Glanvilles, of Catchfrench, in this parish, held the great tithes of St. Germans for nearly three centuries, the lease having only run out in recent years. This John Glanville, born in 1599, married at the age of 15, and at his ordination was presented to the rectory of Withell, Cornwall; he died in 1631. At the head of this mural monument are the arms of Glanville (three crosses saltire, with a crescent for difference) impaling the old Norman coat of Glanville (a chief indented). This is a freak in heraldry; the impaled coat has no connexion with his wife, who was a daughter of the Rev. Jacob Pulston. Below the arms, which are flanked with the birth and death dates, appears the following remarkable and peculiarly ingenious Latin acrostic. The initial letter of each line yields "Johannes," the middle letter "Glanvill," whilst the terminal letters form the word "minister."

I nditur in gelidum	G regis hujus opili› bustu	M
O mnibus irriguus	L achrymis, simul urbis et ægr	I.
H ujus erit vivax,	A tque indelebile nome	N.
A rtibus et linguis,	N ecnon virtute probat	I.
N obis ille novæ	V atem (pro munere) legi	S
N aviter et graviter,	I ucunde et suaviter, egi	T.
E rgo relanguenti	L icet eluctetur ab or	E
S piritus; æternum	L ucebit totus, ut aste	R.

There are various later monuments to the Glanville family.

In the chapel on the north side of the church is the table-tomb of John Moyle, who died in 1661, aged 72. The arms of Moyle, which are a mule passant (an instance of canting heraldry), impaling those of Prideaux, are sculptured with much precision and care. There is a long Latin inscription to John Moyle, of Bake; he was sheriff of Cornwall in 1624. A floor slab close by bears an inscription to his wife, who bore the remarkable Christian name of "Admonition"; she was daughter of Sir Edmund Prideaux, Bart. Another much-worn stone commemorates their second son, Sir Walter Moyle, Kt., 1701.

The earliest monument to the St. Germans family is a floor-stone to Ann, relict of William Eliot, Esq., 1723.

RAILWAY FOG SIGNALLING.

ALL railway passengers are at one in thinking that the employment of detonators, lamps, and flags constitutes a very obsolete system of fog signalling. Railway engineers are, doubtless, of the same opinion, but, having always before them the safety of the travelling public, they will make no sweeping change until a perfect substitute has been found. Numerous inventors have patented the only rational system of fog signalling apparatus, and each invention is better than all the others—individually or collectively. If all these inventors had agreed upon an identical device things would be more simple, and the railway companies might easily be convinced. As matters stand, there are too many systems to choose from. And it is of no use to satisfy one company; all the railway companies must be satisfied. Except for purely local purposes, the system selected must be universally approved and adopted. Past experience in connexion with brakes and couplings shows that such a result can scarcely be expected save by compulsory legislation, which is not a hopeful alternative.

In a recent article we mentioned the electrical method of signalling on the Great Northern and City Railway. This, however, is not suitable for fog signalling on complicated portions of a railway system, although giving every satisfaction on a short electric railway. Another device, patented by Mr. W. Brierley, has been favourably spoken of by Colonel Yorke, and tried by the Great Northern Railway, with results that are said to be satisfactory as far as they go. The invention is mechanical in character, and involves the use of a "rocker" fixed on the permanent way and capable of being set at "danger" or "all right" from the nearest signal box. Assuming the apparatus to be in perfect order, one of these signals must be communicated to every passing train by one of two "triggers" attached to the engine, and the signal can be repeated by bell, whistle, or dial in the cab of the engine. The rocker and the two triggers are returned to the normal position by means of spiral springs. In our opinion the chief objection to this apparatus is that injury might result from the tremendous shock due to the impact of the trigger attached to a heavy train travelling at fifty or sixty miles an hour; and even admitting all the parts to be so balanced and adjusted that the force is taken up by the springs, any of these springs might fail at an early period in its existence through the development of some unsuspected flaw, or owing to the brittleness arising from frequent repetitions of stress. But there are numerous requirements to be fulfilled by any automatic or semi-automatic system of fog signalling. Among the foremost of these are:—Certain action, simple construction, slow deterioration, protection from damage, easy replacement of damaged parts, minimum attention, applicability for starting, differentiation between home and distance signals, repetition in the signal box, a clearing signal given from the tail of the train, failure of action to give "danger" signal in the engine cab, and the apparatus to be unaffected by weather.

A form of apparatus which, it is claimed, complies with all these conditions is employed in the system of magnetic signalling without contact, patented by Mr. W. S. Boult, and tried four or five years ago with successful results on the Great Northern Railway. This method avoids the disadvantages inseparable from mechanical contact; but, while appearing to have everything in its favour, has failed to secure the universal approval of railway engineers, except perhaps in a purely academic sense.

We do not for a moment believe that the problem of fog signalling is really difficult of satisfactory solution. If the chief railway companies could only agree among themselves to appoint a joint committee of experts it is probable that a thoroughly workable and reliable system could be devised or adapted within a few weeks or months. But the trouble is that the companies seem to have no desire for joint action. Each company prefers to hang back, waiting to see what the others will do.

NOTES.

The Sussex Building Case. THE proceedings taken by the Chailey Rural Council against Sir William Grantham have followed a course which is not of general importance to the public. The question seems to have resolved itself into one of fact as to whether the plans submitted were sufficiently intelligible and in compliance with the by-laws in force in the district. The magistrates, in coming to their so-called "finding," appear to have lost themselves, and the defendant has been neither convicted nor acquitted, nor does the verdict even comply with that known in Scotch law as "not proven." We have heard of decisions which amount to "not guilty, but don't do it again," and this would appear to be the verdict of the learned magistrates of the Lewes Petty Sessions. It is not a satisfactory conclusion, but it is perhaps the only one that was possible to the magistrates. The real questions are whether the by-laws affecting rural buildings are unreasonable in their operation, and whether the officials who have to enforce them are competent for their task. On the latter point there is no certain evidence, and probably the condition of things in this respect varies very much in different districts. On the former point the magistrates could scarcely have been expected to pronounce a decision; it would have been *ultra vires* for them to do so, and it is in any case a matter requiring very careful consideration. We certainly cannot recommend that building by-laws should be abrogated in the case of rural cottages; they should be simplified and confined to matters really affecting the healthfulness of a habitation; but it cannot be permitted that landlords, because they are willing to build cottages for their tenants, should be allowed to build just as they please; the results might be very injurious. The case under special consideration is not so one-sided as writers in popular prints appear to think. The plans by Sir W. Grantham which we have seen published do not by any means lead us to think that he should be trusted to build cottages without supervision by the authorities. The case has been made the occasion, in fact, for a popular outcry which is by no means altogether reasonable, and is set up by people who do not know much about building or sanitation.

Labour and Trades Unions. THE reports of the labour department of the Board of Trade show continued depression in the labour market affecting nearly every class of employment, yet there is a satisfactory decrease in labour disputes, the number of workpeople affected in November being about 13,000 fewer than in November of last year. The memorandum of the Board of Trade as to the position of Trades Unions in the year 1903 contains matter of considerable interest in view of the above facts. Despite a small decrease in membership the funds of the principal Unions attained a record amount, viz., 4,550,000*l*., and this satisfactory state of affairs is attributed to the fact that last year there were so few disputes that only 170,000*l*. was expended on strike pay. This gives a percentage of only ten per cent. for strike pay, whilst the amounts expended in directly benefiting the workpeople was sixty-eight per cent. The twelve years, 1892-1903, give an average of eighteen per cent. strike pay. To what causes may this reduction in trades disputes be reasonably traced at a time of commercial depression usually so conducive to strikes? The only answer appears to be that it must be attributed to the salutary construction which has been placed on the law affecting Trades Unions, and it is to be hoped that the natural common sense of the working man may prevail against the Councils of the agitators, and that the above figures may show him how much it is to his own interests that the funds of the Trades Unions should be devoted to his direct benefit and not be frittered away in strike pay, and litigation, and agitators' expenses.

Construction of a Building Contract. THE case of Robins *v.* Goddard, in which a somewhat novel construction was placed by Mr. Justice Farwell upon a building contract in the form sanctioned by the Royal Institute of British Architects, and which was commented upon by us recently, has been carried to the Court of Appeal, where the decision has been reversed. The action was brought by the builder claiming sums due to him under the contract as certified by the architect, and the defendant counter-claimed in respect of defective work and materials. Clause 17 of the contract gave the architect power to order defective work to be made good, and Mr. Justice Farwell considered this clause excluded the jurisdiction of the Court over the counter-claim in the absence of any such order in the architect's final certificate. The Court of Appeal have, however, pointed out that under this contract this was not the exclusive remedy, since clause 32 contained an arbitration clause which also was applicable

to the matter in dispute. It is further to be observed that clause 30 specially provided that "No certificate of the architect shall be conclusive evidence as to the sufficiency of any work or materials to which it relates, nor shall it relieve the contractor from his liability to make good all defects as provided by this agreement." Mr. Justice Farwell so read this clause that he substituted for the word "nor" the words "so as to relieve, etc." and the Court of Appeal also dissented from this construction. In the result, therefore, the final certificate given by the architect was held not to be conclusive of the matters in dispute, and the order of the Court was that they should be referred to a referee to be agreed upon by the parties.

Electrification of the Underground Railways.

WITH the exception of the new line between Harrow and Uxbridge, there is little indication of electric traction on the Metropolitan Railway, but we understand that the Baker-street and Harrow section will be thrown open to electric traffic early next week. This will give the public an electrically operated train service from Baker-street to Uxbridge, although steam locomotives will not be entirely abolished until a later date. Satisfactory progress continues in the equipment of the great generating stations of the two underground companies at Neasden and Chelsea and upon the distribution systems of the respective lines. At the present time it is impossible to say when the final act in the conversion of the inner circle may be expected. It is satisfactory to learn, however, that a complete understanding has been effected between the Metropolitan and the District companies as to the interchange of current for the purposes of operation. In the cars about to be employed on the Metropolitan line Londoners will find a fair sample of what may be looked for on the inner circle. The cars are on the corridor system, excellently lighted, and provided with electric heaters, and, more important still, no inflammable material has been employed in their construction.

Tramways and Municipalities.

THE decision in the case The London, Deptford, and Greenwich Tramways Co. and the London County Council is one which will surprise no one. The Tramway Company, which had acquired its Parliamentary powers at a time when no liability was incurred by such undertakings to bear some portion of street widening, in an arbitration to ascertain the value of the tramway for compulsory sale to the County Council claimed some 22,000*l.* on the ground of this immunity. This claim was disallowed, and indeed it seems more remote than even "moral and intellectual damages." The case, however, does serve to draw attention once more to the fact that it is to the interests of the ratepayers that such undertakings should be undertaken by private companies and not by corporations. In the former case the ratepayers are relieved at once of one-third of the cost of road widening, and as we pointed out in the case of the London United Tramway in an extension of only some seven or eight miles, this company had to expend some 200,000*l.* on public improvements, and this system is, moreover, not confined to the jurisdiction of one corporation.

The Isle of Wight Coast.

SINCE the publication of our last "Note" on this subject, further anxiety has been caused to the inhabitants of Freshwater owing to the action of unusually high tides and heavy seas. On Dec. 9 an Emergency Committee of the Isle of Wight Rural District Council visited Freshwater, and were much impressed with the serious damage done by recent storms. They had good reason for solicitude, for an enormous mass of concrete has been torn away from the sea wall, and so large a gap has been made in the esplanade as to imperil the foundations of various buildings. Still, so far as we are aware, no action has resulted from the visit of this Committee. On Dec. 22, however, a letter was received from the Local Government Board, goaded into action by an urgent representation from the Freshwater Parish Council, asking what the District Council were doing with respect to the question of protecting the threatened shore. This letter has produced some effect, for after discussion it was decided to take preliminary steps for carrying out the recommendation of the surveyor to the Hampshire County Council that the main road running along Freshwater Bay should be raised several feet, and protected by a substantial sloping wall. But we observe with regret that the Council merely propose "preliminary steps," and, as the County Council are to be asked to bear the cost of the works, it is much to be feared that the decision is merely intended to satisfy the Local Government Board, and that no serious attempt will be made to protect the coast unless the County Council are willing to provide the money. So far as can be judged by their past tactics the District Council would rather let the whole island be washed away than spend a penny on defensive works.

A Novel Lock for Canals.

THE ingenuity of French engineering is well illustrated by the tilting lock-chamber invented by M. Cardot, of Paris. This device is intended for raising or lowering a barge or other vessel without the necessity for wasting any water. Below the upper lock gate of the canal a masonry chamber is constructed so as to be always in communication with the lower reach of the canal. The bottom of the chamber slopes from each end up to a ridge not far from the upper end, and on this ridge is pivoted the tilting chamber, formed with two walls of steel plate, water being held in the inner compartment, and air in the outer. In one position of the chamber a barge can enter through gates in the end, and when these gates have been closed the chamber can be tilted by means of a heavy weight running along the bottom of the air compartment, the weight being moved by means of a wire cable and a suitable crab. When the chamber has been tilted, the water in the inner compartment is at the level of the water in the upper reach of the canal, and the barge can pass out through gates like those by which it entered. The reverse operation is conducted in a similar way. A device of this kind might be useful in connexion with canals where traffic is liable to interruption owing to severe droughts, or where traffic requirements involve undesirably heavy expenditure by necessitating the use of more water than is essential for preventing stagnation.

Aqueducts.

A PAPER on "Aqueducts, their Location and Survey," read before the Manchester University Engineering Society by Mr. A. H. Jameson, possesses considerable interest to those engaged in work of the kind considered by the author. After dealing with various methods of constructing water conduits, and discussing overflow weirs, washouts, automatic closing valves, and other details, Mr. Jameson described the method of surveying for a modern aqueduct, taking as an example that of the Derwent Valley Waterworks. The survey for that undertaking was evidently executed with the greatest care and a high degree of accuracy. For a great part of the distance the line ran over hilly country, and to facilitate correct linear measurements a steel tape was employed in place of the ordinary chain, the tape being adjusted horizontally by means of a spirit level. As the average gradient of the aqueduct was little more than 12 in. in a mile, it was necessary to be most particular with levelling and contouring work. Hence a circular spirit level was attached to the staff for the purpose of assisting the operator to adjust it in a perfectly vertical position, a device now generally adopted for accurate work. It is well known by surveyors that ordnance benchmarks can by no means be accepted as infallible guides, a view further confirmed by the experience of Mr. Jameson during the Derwent Valley survey. A noteworthy point made by the author was that the extreme accuracy of this survey resulted in the saving of some thousands of pounds in the actual construction of the aqueduct.

Steel at High Temperatures.

THE results of some interesting tests by Professor Bach, of Stuttgart, of the strength of steel at high temperatures have recently been made public. In one set of experiments some of the bars were subjected to tensile tests at ordinary temperatures, and others at temperatures ranging from 200 deg. to 550 deg. C. From the results it became evident that strength had increased up to 300 deg. C., thenceforward falling approximately in proportion to the temperature to about half the original value. The ultimate extension at 200 deg. C. was less than one-third of the value at normal temperature, but at 550 deg. it was over fifty per cent. higher than the normal value. The contraction of area was reduced at 200 deg., but began to increase after the temperature of 300 deg. had been passed. Another series of bars tested were heated and kept under load for considerable periods, with the result that at 300 deg. C. a slight diminution of strength was observed, and more marked diminution at 400 deg. and 500 deg. C. At the same time it was noticed that the extension, and the contraction of area, increased between 300 and 400 deg. C., and decreased beyond 400 deg. until at 500 deg. C. the

average values were about 22 per cent. lower than those obtained by tests of the usual duration. The second set of experiments here mentioned indicates that for steel intended to be used at high temperatures, as in the case of steam boilers, for instance, it would be wise to insist upon the conduct of commercial tests at corresponding temperatures. An additional reason for the adoption of this course is to be found in the brittleness observed by Professor Martens and other investigators in steel at temperatures above 300 deg. C.

Fog Dispelling Apparatus.

In a letter to the *Times*, published last Friday, Sir Oliver Lodge states that he is prepared to show to a deputation of municipal or other engineers the apparatus which he has invented for dispelling fogs. A description of the method he adopts will be found in patent No. 24,305 of 1903 which is entitled "Improvements in means for the production of continuous high potential electrical discharges applicable for the deposition of dust, fume, smoke, fog, and mist, for the production of rain and for other purposes." The principal claims made by Sir Oliver Lodge in his patent are in connexion with commercial methods of causing small particles in the atmosphere to coalesce into larger ones by means of high pressure electrical discharges from points. The larger particles fall by their own weight and so clear the atmosphere. The method is an extension of a discovery made by Mr. John Aitken, of Edinburgh, in 1880. He found that neither a cloud nor a mist globule could form without some solid basis as centre, so that in perfectly clear and dust-free air neither could mists form nor vapour condense. Every cloud or mist globule is slowly falling; if we make these globules coalesce, then the velocity of falling will become appreciable and the cloud or mist will soon be dispersed. C. T. R. Wilson, of Cambridge, discovered that condensation of vapour in dust-free air could be produced by Röntgen rays, each "ion" of electricity forming a condensation centre. If we produce, therefore, ions artificially on a large scale, the globules of water that are in the air will gradually increase in size and new globules will form round the ions. In addition, the electrification diminishes the surface tension of the water, and so the globules coalesce readily. This can be shown easily by rubbing a stick of sealing wax with flannel and holding it near a thin jet of water. The drops run together in a remarkable manner when the wax is held within two or three feet of them. We think that Sir Oliver Lodge's apparatus might be set up with advantage in the neighbourhood of Trafalgar-square, for example. The unsightly portion of it could be wheeled away, like the gas flares, when not required. We know that his apparatus has been successful over a space of about fifty yards in radius both at Liverpool and Birmingham, and if an equal area of London fog could be dispersed by the same means it would prove more economical than trying to illuminate it.

The Efficiency of Nozzles.

During the last quarter of a century much has been done to increase the efficiency of nozzles such as are used for fire and power purposes. The most recent series of experiments was conducted by Mr. H. C. Crowell and Mr. G. C. D. Lenth at the Civil Engineering Department of the Massachusetts Institute of Technology, Boston, for the purpose of determining the efficiency of the Doble nozzle. The characteristic features of the nozzle are the tip and the needle regulator within it. The latter, having the shape of a plumb-bob, is attached to a steel spindle provided with a hand-wheel for regulation. At the commencement the attention of the authors was at once directed to the clear and polished stream of water issuing from the jet and to the absence of all spraying near the tip, as compared with the feathery appearance of the stream from an ordinary fire nozzle. To find the reason for this was the first subject of investigation. After various experiments, it was concluded that the feathered appearance of the stream from an ordinary nozzle is due to the difference in the velocity of the particles of water, and that the amount of retardation of velocity of the outer layers determines the degree of feathered appearance. Inquiry was next made into the distribution of velocity in jets, and we notice that the most marked characteristic of all the velocity curves for the Doble nozzle is that the maximum velocity in the stream occurs quite close to the edge. Another remarkable feature is the high velocity in the centre of the jet from the same nozzle, even within half an inch from the needle. Notwithstanding variations of the centre velocity due to different settings of the needle, the velocity of the exterior particles of water changed almost imperceptibly, and the jet maintained its smooth, glassy appearance for a long distance from the nozzle. Twenty experiments were made to determine the efficiency of the jet under different conditions of head and setting, and, rejecting one or two doubtful results, the efficiencies under constant head varied between 96·4 and 99·3 per cent. This result shows the marked superiority of the nozzle in question over all forms of conical nozzles. The authors had hoped that the results would help them to establish the relation of efficiency to head, but unavoidable errors in measurement made it impossible to draw any definite conclusion with regard to this point.

Sanitary Condition of Itchen Urban District.

Dr. H. Timbrell Bulstrode has made a Report to the Local Government Board on the sanitary condition of the Itchen Urban District, where there has been a prevalence of enteric fever. The state of things does not seem to be so bad, in a sanitary sense, as in many cases on which Reports have been sent in to the Board. Dr. Bulstrode considers that, generally speaking, there is no overcrowding of houses upon area, though in certain parts of the old village of Itchen there is some very dilapidated property and some of the houses appear to have been deserted by reason of their being actually uninhabitable. The closet accommodation is in places inadequate, and one householder complained that in connexion with her house there was no such accommodation whatever. In what may be termed the strictly urban portion of the population the supply from the mains of the South Hants Water Company is general, but in the rural portions of the district wells are still to be found, and these are for the most part dry steined only, and the coverings to the wells are not always such as to prevent the risk of pollution of the water by surface washings. In regard to sewerage, the urban district may be regarded as consisting of two parts—a smaller, the more populated, which is sewered; and a larger, the more rural portion, which is still unsewered. The sewered area is also, in a sense, divided into two portions—a larger, in which the sewage flows entirely by gravitation, and a smaller low-lying area, comprising a population of about 800, the sewage of which flows into a large circular tank, from which it is pumped into the high-level system. As regards the low-level system, there is evidence on the walls of the manholes of prolonged damming back of sewage both in the northern and southern sewers. This is due to the fact that up to the present time continuous pumping from the storage tank has not been resorted to. This damming back of the sewage in the above manner is, of course, objectionable, and if continuous pumping is not to be resorted to it will be desirable to lower the storage tank, if practicable.

St. John's Church, Newcastle-on-Tyne.

Though a sum of, it is stated, 200,000*l.* is offered for the site, the contemplated destruction of this church is strongly opposed in the locality. The Church of St. John the Baptist, in Westgate-street at the corner of Grainger-street West, is the most ancient in Newcastle; it was built for the most part in the XIIIth century, yet retains features of an earlier period. Edward Spoor restored the fabric in 1861, when he removed the galleries and opened out the roof by taking down the plastered ceilings; some further reparations were made subsequently, at a total expenditure of 11,000*l.*; and nine years ago a Norman window in the chancel was reopened. The church contains many old monuments; in the churchyard is the grave of John Cunningham, the pastoral poet, who died on September 18, 1773. At their meeting on December 21, the vicar and churchwardens unanimously declined to agree to a proposal submitted to them by the Bishop of Newcastle for the sale of the site and churchyard and the rebuilding of the fabric, with the existing stones, elsewhere.

Kensington Gardens.

On two or three occasions of late we have directed attention to the disfigurement and spoliation of Kensington Gardens by the wanton conversion of pleasant and secluded foot-paths across the turf into wide and formal gravel walks with iron fencing at the side. We find that yet another walk after that kind is being made over the lawns and through the trees from a junction with the Broad Walk, near the Basin or Round Pond, towards Queen's-gate: The gravel walk is laid through a comparatively unfrequented spot, lying at the foot of the slope, where the pines formerly flourished, and greatly impairs the natural charm and attractiveness of that part of the gardens.

The Strand Improvements.

UNDER this heading Mr. T. G. Jackson makes in the *Times* a protest, with which we are entirely in sympathy, in regard to the want of consideration of existing buildings in the schemes for Strand improvement. He points out that the scale of the Strand architecture is set by Somerset House and the two churches, and that the threatened erection of immense buildings on the northern Strand frontage must have the effect of entirely overpowering these. In short, the true principle in such matters is to consider the character of the old buildings as well as that of the new ones; a consideration far too often lost sight of in what are called "street improvements."

BITONTO.

BITONTO is easily reached by steam tram from Bari, lying some eleven miles north-west of that city. Like many others of the Apulian cities, it was a Greek colony, though there are no remains of antiquity to be seen now. Coins have been found—one type with a head of Pallas armed and on the reverse an owl resting upon a branch of laurel, another with Pallas, and on the reverse an ear of corn and the inscription "Butontunon," and a third with an owl above a branch of olive and on the reverse striated clouds and the word "Bytontynon" in ancient Greek characters. In the Itinerary of Antonine Butuntus is mentioned as being on the Trajan way between Ruvo and Bari, and nothing is known of its ancient history, but in 1010 the Greeks lost a battle here during Melo da Bari's insurrection. The earliest bishop about whom one can be certain is Otto, whose name occurs in 754; but the Cathedral is the latest of the great Norman churches, and must replace an earlier building. It was founded in 1175-1200, but although the main fabric was finished in these twenty-five years, work went on for at least forty years after, the high altar having been made by Mag. Gualterio di Riccardo da Foggia in 1240, and many chapels and altars were added in the XIVth and XVth centuries. Two of the bishops of Bitonto became popes; Giulio de Medici in 1523 as Clement VIIth, and Alessandro Farnese in 1534 as Paul III. In the XVIIIth century a zealous bishop, Domenico Cedronio, beautified it according to the taste of the day, using a fund of 12,000 ducats left by his predecessor Giovanni Battista Capanus, who died in 1720, and some of this work still remains, though much of it has been removed. In 1818 the diocese was joined to that of Ruvo, so that the church is no longer a cathedral.

In 1248, 1252, and 1254 Bitonto was sacked, and there seems to have been little building done for a century afterwards, the palaces, of which a few examples still remain, indicating that it was once a rich city, being all of a later date. It was, in fact, in the XVth century one of the richest and most noble cities of Apulia, and its principal families—the Vulpano, Rogadeo, Scaraggi, Ferraris, and Bove—were in close commercial relations with all their equals in the other Apulian cities and with the most notable houses of Tuscany, Lombardy, and Venetia, to whom they were often united by ties of blood or marriage. The meeting-place of the merchants was either the house of the citizens' "Università" or the seats or "planchetum," of which the traces are still to be seen before the Cathedral or at the side of one of the churches. Of the magnificence of the earlier times but few remains exist, though two palaces of a later date are noticeable, the Palazzo Regna and Sylos-Calo. One palace, the Palazzo Sylos-Labini, preserves its courtyard (Fig. 1, built for the Vulpano by local craftsmen in 1500, but designed by an architect of Lombardy. The elaborately-carved parapet wall shows busts and portrait heads, half-lengths of Scipio Africanus and Hannibal, the Carthaginian (so labelled) horsemen fighting, and two symbolical figures guarding the family arms—one a man in armour with drawn sword, seated on a curious wheeled throne, the other a crowned woman bearing a branch of some tree, whose seat shows the heads of two snakes, their bodies apparently coiled below, and who has clouds beneath her feet. The pillars are rather heavy, but the whole effect is imposing. At the side is a pretty little well ornamented with garlands. The Vulpano family gave to the town notaries, doctors, and priests, and had commercial relations with the Medici, Gaddi, and Serragli of Florence, the Tolomei of Siena, the Lampugnani of Milan, the Bragadino, Bembo, and Loredan of Venice. At the end of 1445 a Maestro Pietro di Giovanni of Bari, wood or stone carver, was owed more than an "oncia" of silver carlini by Goffredo, the son of the notary Angelo di Vulpano, and names of sculptors from Bitonto occur about this time in the archives of Bari, showing that there was a school of carvers in the city. In 1446 an "Antonius Nicolai Sculturi de Botonto" is named, and in 1454 a "Maestro Bartolommeo di Maestro Nardo di Bitonto." The buildings put up in Bitonto during the last thirty years of the XVth

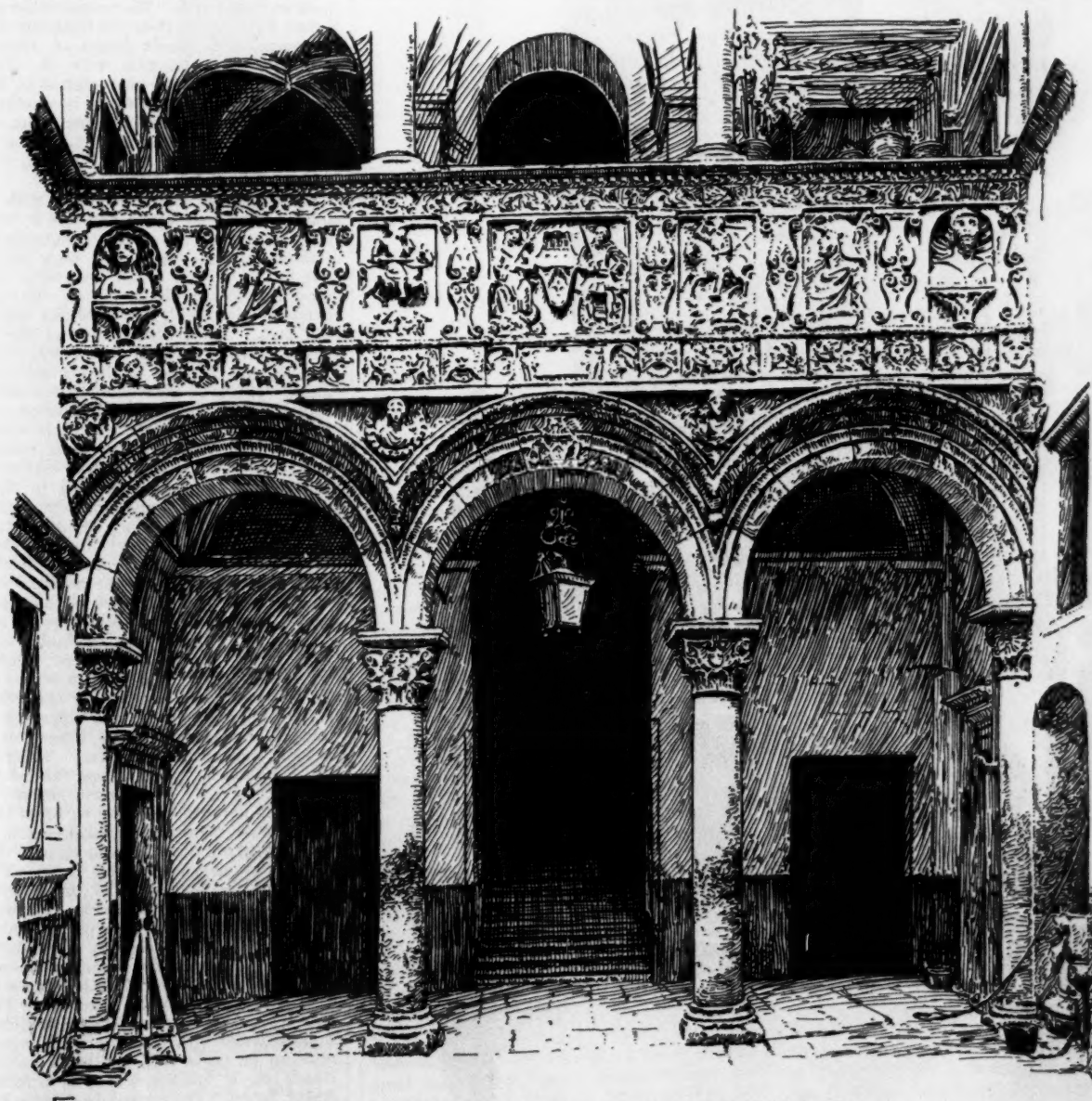


Fig. 1. Bitonto: Courtyard of Palazzo Sylos-Labini.

century were due to—Maestro Matteo the Lombard; Maestro Bartolommeo di San Severino, living in Bitonto; Maestro Marco di Pietro di Maruggio; and Maestro Bartolommeo di Altamura, citizen of Bitonto—who are frequently named in deeds of the time. Matteo was originally a merchant, and came from Varese (near which was the home of the architects of Modena Cathedral), but gave up trade and took to being a master builder. These names show how the different styles of far-distant parts of the peninsula met and mingled in Apulia, as the names of the artificers of earlier date at Bari also show. The former cathedral is now dedicated to S. Valentine. It was originally a Benedictine church dedicated to S. Maria Asaunta, founded by the judge Maggiore, son of Pasquale, King's justiciar of Terra di Bari, and given to the abbey of La Cava, which ceded it to the clergy and people of Bitonto in return for an annual tribute. It was consecrated by Bishop William of Tipaldo. It has a central nave and aisles with chapels beyond between buttresses, which were probably once outside the wall and which make the present exterior one straight line from transept to west end, except where the "porta della Scomunica" shows its original position. There are three apses masked by a wall between the two flanking towers as at Bari, and the western façade has the Lombard pilaster strips. There is a crypt beneath the raised transepts and choir almost exactly like that at S. Nicola, Bari, except that none of the shafts or caps appear to be antique, and that the vault is painted instead of having stucco ornament. It has thirty-two columns and corresponding pilasters in the walls, roughly-cut caps and vaulting ribs, and is probably the oldest part of the church. The principal door has above it the Imperial eagle, and during the restorations several portions of busts were found which belonged to the external gallery draped as the figure of Frederick II. is on his augustals, which confirms the date ascribed to it, viz., 1200. There appears to have been a porch at one time, or perhaps the intention of erecting one shown by the springings of arches outwards at the ends beyond the side doors and on the pilaster strips. The bas-relief of the central tympanum shows the Harrowing of Hell. Below, on the architrave, are the Annunciation, the Salutation, the Adoration of the Kings and the Presentation in the Temple. Round the door runs a double band of arabesques; in the inner monsters intertwine with the stems in a masterly fashion, the outer has rosettes as the central feature of each convolution. Above is a projecting hood-mould richly carved with acanthus and volutes, which are made to form a band outside the foliage. The lower portion of the composition is the usual crouching lion on a bracket-kind of pedestal, with a beautifully proportioned column and cap which supports rather more foolish-looking griffins than usual. The Imperial eagle on the summit of the arch looks like a later addition, and has no connexion with the design. Above it is a carved string course to which two two-light windows are connected by the ornament round them, and higher still is a round window with a hoodmould, at the top of which is a sphinx which is flanked by two lions on pillars supported by corbels. The gable finishes with a round, arched, corbelled cornice as usual, which also returns below the eaves of the nave wall. All the ornament is finely carved, and on the whole better than that of the external gallery. The side doors are simple square-headed openings beneath a round-arched tympanum; above each is a two-light window. The clerestory windows have pierced slabs of stone as at Bari, restored from fragments found. The chess-board billet-moulding was adopted by the Hautevilles as their device. Here it occurs at the top of the transept gable, in which there is a good rose window, below which are two stories of two-light windows much altered and built up. The lowest story has a blind arcading, four small arches beneath two larger in the usual manner, an enrichment which also runs along the base of the tower and of the apse. The "porta della Scomunica," a pointed arch beneath a round arch with a crucifixion in its lunette comes next to the transept, and is recessed between that and the walls of the chapels of the nave. The round arched arcade of this wall has single round-headed windows in four of the five spaces, the fifth being broader and pointed. The Venetian dentil is used to enrich the pilaster imposts. There is now one small campanile at the east end, built at the beginning of the XIIIth century but recast in 1484, and finished four years later when the clock was fixed in it. The names of the masters, Murzio Barba of S. Pietro in Galatina, Paolo de Borgencia, and Nicola Santo of Bitonto are mentioned in connexion with it. The apse window is of the same character as at Bari but less ornate. High above it is another of a curious shape. The arch is almost four-centred, broad, and slightly pointed, with a row of four colonnettes in the splay of the wall, very low in proportion to the width.

The walls are solid, not filled with rubble, and the stones are keyed together so that they show no signs of failure, notwithstanding earthquakes and sieges. On each side of the nave are six arches, round, but with voussoirs deepening towards the keystone. The piers are square in plan, with half columns engaged on each face. The dividing walls of the chapels have a similar engaged half column opposite the pier, and the sides of the central apse have similar columns. The chapels are all newly decorated. The caps of the columns are very varied, showing animals and birds among the leaves. The triforium has been opened out again, the XVIIIth century disfigurements having been removed, as also in the nave roof; but the apse and transept still retain them, and the flat ceiling of the latter hides the rose from view from inside. There are three arches beneath a larger one in each bay with caps and bases to the well-proportioned columns. A curious feature is that the outer arch is borne by a little squat pillar standing on the cap. There were originally no stairs to the first floor of the towers. During the restorations a little door was discovered towards the transept, and another on the other side in the aisle; the tower was approached by a drawbridge between these doors, called in ancient documents "gaifum," according to Sig. E. Bernich, under whom the restorations were carried out. In the nave are two ambos, which M. Bertaux considers to be of the same date, though they are very different in design. One (Fig. 2) is dated 1229, and signed "Nicolaus sacerdos et magister." This is the same man who signs the first story of the campanile at Trani. He was probably a Roman Benedictine. The whole inscription runs "Hoc opus fecit Nicolaus sacerdos et magister anno millesimo ducentesimo vicesimo nono Docta manus me fecit ad hoc ut lectio vite hic recitata ferat fructum mentes A," and below the book desk "Nicolaus Magister" is still legible. This is ornamented with arabesques underneath, and rests on an eagle with fine large feathers. It stands on a bracket, which is upheld by a seated figure. The curved projecting centre is decorated with rosettes in coffers, between which are bands of inlaid circles; the rectangular

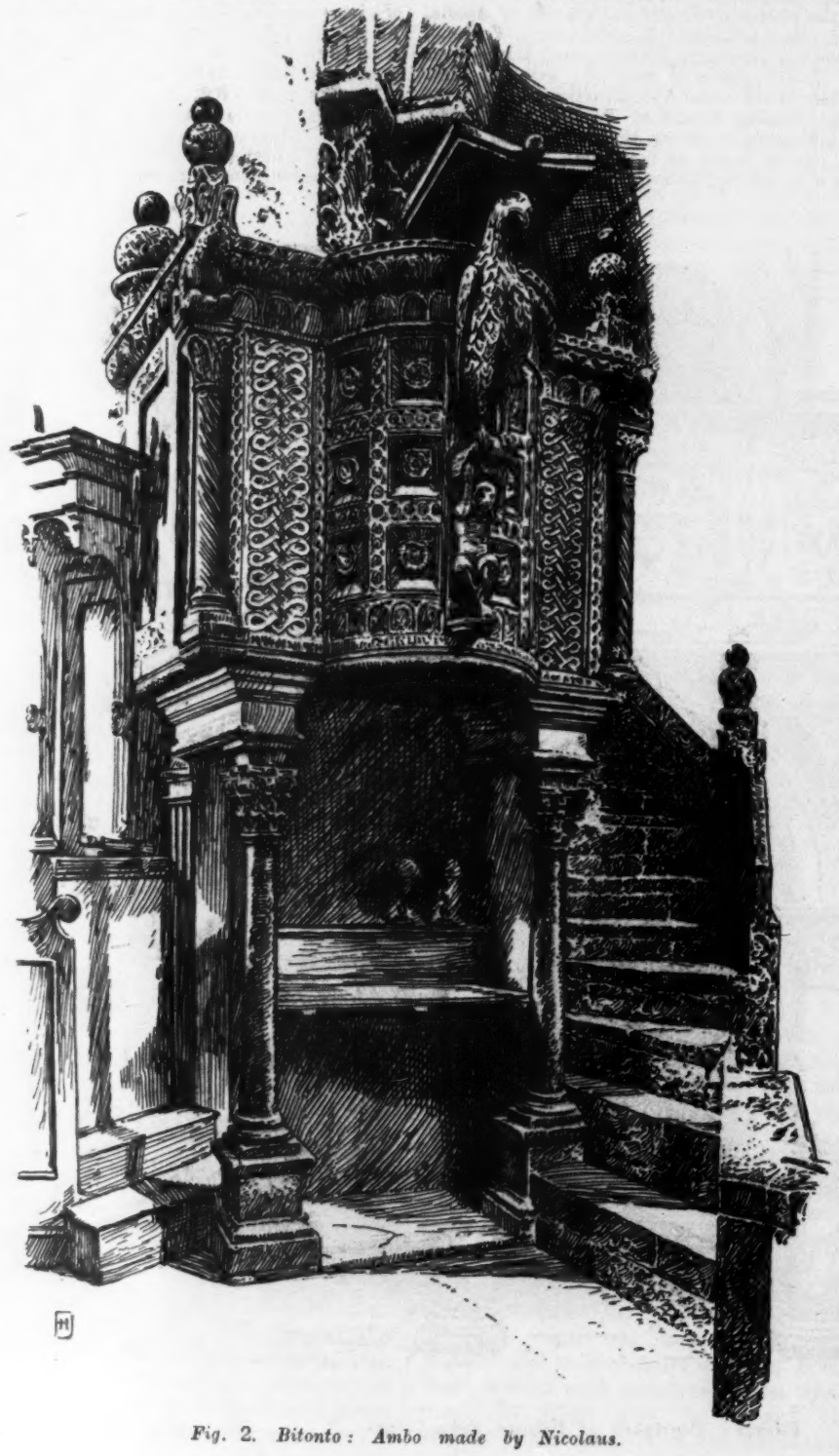


Fig. 2. Bitonto: Ambo made by Nicolaus.

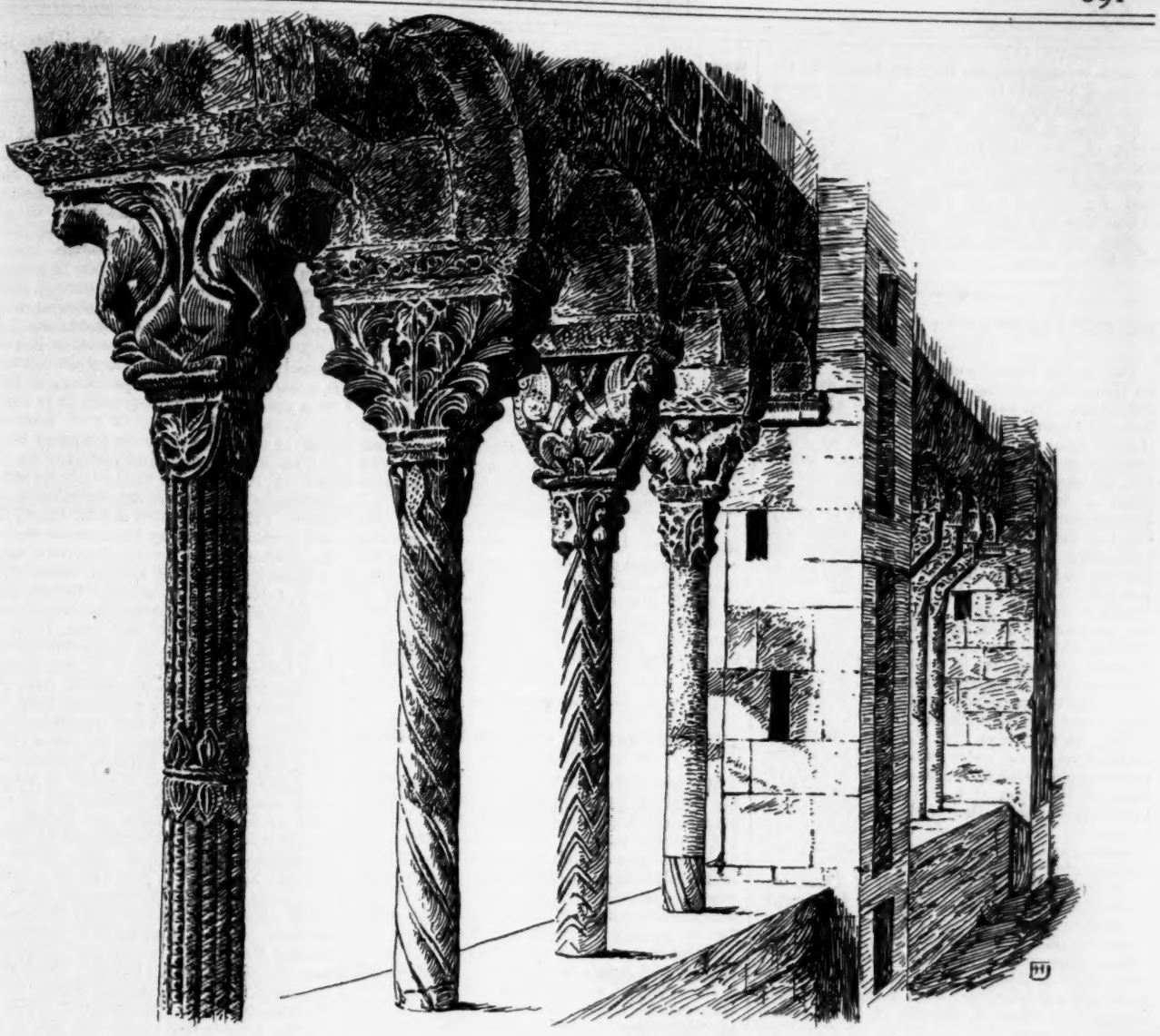


Fig. 3. Bitonto: External Gallery beyond Matroneum.

parts have panels and bands of ornamental interlacings. At each corner is a twisted column supporting a lion and a griffin respectively. Above the richly-carved cornice are ornamental terminations, which all consist of a ball of coloured marble above another carved like basket work, upon a base also carved with ornament. The side panels are plain. It is much inlaid with marbles of varied colour, and also with pieces of gilded glass with painting between glass and gold. The columns upon which it rests are of later date, and the stairs also must have been altered when it was placed in its present position, just within the rails of the choir on the right side. On the sloping parapet of the stair are carved figures of Henry VI., Constance his wife, Frederick II. with his son, and the Imperial eagle. Schulz describes the scene as the Adoration of the Kings. "Mary sits on a throne with a crown on her head, she has a lily sceptre in her hand. The kings have barbaric, broad faces, and short, full, pleated clothes. They stand on little corbels." The figures are beneath a corbelled arcade, with a boss beneath each arch ramping with the slope of the stairs. The font is of the same character as this ambo, and is the work of the same Nicolaus. It has a large bowl with an arcade upon it radiating from the bottom with bands of XIIth century ornament upon the archivolts, and a conical later cover. The nave capitals are much varied, and some of them very good. They also are ascribed to Nicolaus, whose work they resemble. The other ambo, which is square with bands and panels of flat ornament, was the work of Mag. Bonifacio. It rests upon two columns, which were inlaid. The two front ones, with arabesques cut deeply, the back ones twisted. The panels of rosettes and interwoven cords were also inlaid with vitreous pastes, and in the centre of the larger compartments on one side creatures are painted upon the enamel. Sig. Avena says that this pulpit makes one think that Arab artists worked here, but the design is not Oriental, and the Norman chequer appears in the abacus. The altar and ciborium, made in 1240 by Mag. Gualterio da Foggia, was destroyed in the XVIIth century; part of the ciborium may be seen in the tomb of Bishop Carafa—small columns with varied caps. The inscription is preserved in the hall of the bishop's palace. The ancient frontal was discovered adapted to the altar in the chapel of S. Gregory Thaumaturgus. It has in the centre a little window, with columns and caps and a foliated architrave. In the treasury is an interesting silver-gilt chalice of XVth century Abruzzese work about a foot high. It is marked T & R beneath, and was probably the work of Niccolo Gallucci of Guardiagrele, who worked at Teramo. The foot has six alternate compartments of angels, two coats-of-arms and a Madonna, the three latter with enamel backgrounds, etc., and arabesques. The knop has six panels beneath canopies with the Evangelists' symbols, the Pietà and Ecce Homo with enamel grounds, and above and below six other slighter panels similarly treated with half-length figures of the Apostles. The arms are those of the houses of Taranto and Acquaviva, and it was probably presented by Giulio Antonio Acquaviva, son of the Duke of Atri and Condottiere for his brother-in-law, Giovanni di Balzo Orsini, Prince of Taranto, who seized the city about 1460, on the occasion of the recognition Mass after he was confirmed in possession of the city in 1462 by King Ferdinand of Naples. The gallery outside the Matroneum (Fig. 3) runs above the chapels. It is of the period of Frederick II., and has been roofed and restored with judgment. At Bari similar galleries exist, but they have been built up. The carving of the caps shows great variety and fancy. Many of them have monsters seated back to back, griffins with men's heads, apes with the heads of cats, etc., and others fill the long side with interlacing stems and foliage. The columns have no bases, and are many of them ornamented with channelling, either twisted, zig-zag, or upright, in the last case pearled and interrupted with bands of Oriental detail, and the same influence appears in the curious secondary caps below the large ones by which the circular plan changes to square, cut out of the same piece as the shaft. The XIth century church at Altamura, altered in the XIIIth century under Frederick II., has several curious similarities to this of Bitonto. The pier, which here divides the nave arcade into two groups of three arches, at Altamura is repeated, and divides the seven arches into one group of three and two groups of two arches each; but from them transverse arches span the nave, as at S. Nicola, Bari. The aisles are groined and flanked by a line of chapels, of which the nearest to the transept becomes a recessed porch, as at Bitonto. On the other hand, fresh features appear at Altamura—the bays of the aisle are separated by pointed arches, and transept and apse are square and unbroken, a feature which is English, though occasionally occurring in France.

There are a few Gothic churches in the town, most of which have been sadly modernised. S. Francesco is perhaps the most noticeable, founded in 1283, and consecrated three years later, Romanesque in plan with Gothic details. It has a pointed doorway with carved ornament of pine cones or grapes, and palm or fir leaves a good deal conventionalised. Among these Apulian churches it is not so striking as it would be elsewhere. S. Domenico was built in the first half of the XIVth century by the gifts of Carlo di Durazzo, lord of Bitonto. It had a high altar made by Francesco de Oculato di Bitonto in 1388, at the expense of the noble Vito de Joannone. The door and the holy water basin are noteworthy, and the XVth century monument of Piehuccio Bove.

S. Anna belonged to the Rogadeo family till the middle of the XIVth century. It has a round-arched doorway with zigzag ornament.

Portions of the city wall remain, a round tower of the middle of the XIVth century, and a gate or two, which are picturesque but not remarkable architecturally. There is a good deal of good iron work, principally in the form of knockers and balconies. Many of the former remind one of others seen in far distant parts of Italy.

F. H. J.

RECENT DISCOVERIES IN THE ROMAN FORUM.

SINCE the appearance of my last article on this subject in the *Builder*,* there has been nothing of first-rate importance to chronicle, but the excavations are still being continued, though not, for the moment, with as much activity as heretofore. This has been largely due to Comm. Boni's absence in the summer upon a tour in other countries—including Ireland—undertaken with the object of studying the remains of primitive art there and comparing them with those discovered in the Forum, and also to the fact that it will not be possible to continue the excavations of the Basilica Aemilia upon the site bought for the purpose by a further gift from Mr. Lionel Phillips until the new building at S. Francesca Romana, which is to contain the Forum Museum, the directors' offices, etc., is at least ready for the reception of the latter so that the present structure can be removed.

The winter rains and the consequent rise in the level of the water have led to the temporary abandonment of the stratigraphic explorations in the open area of the Forum and to the further examination of the primitive cemetery close to the temple of Antoninus and Faustina, and work is at present proceeding only in the higher portions.

To the south-east of the arch of Titus, the work of clearing the foundations of the temple generally attributed to Jupiter Stator (*cf.* Lanciani, *Ruins and Excavations*, 200) has been commenced, and the north-east and north-west sides of the concrete core can now be distinguished from the later additions, which consist of a mass of concrete of the Classical period (perhaps the foundation of steps) on the north-east and of the lowest portion of the mediæval Turris Chartularia, in which fragments of white marble are largely employed. A few of the large blocks of stone of the wall which supported the external columns are still *in situ*, and so, perhaps, are portions of the walls of the cellar of the temple. To the north-west of the arch stood, in all probability, the temple of the Lares—though some German authorities prefer to reverse the positions of these two edifices! Of this a portion has probably been discovered—a wall in *opus quadratum* of tufa, upon which rests a travertine pilaster base, upon the north-western edge of the road which ascends to the Palatine. A cross-wall runs for a short distance north-westwards, but both it and the main wall are soon interrupted, having been destroyed by the extensive reconstructions which have taken place. A mass of concrete foundation has been superimposed upon them, and a huge foundation wall of the same material was erected a short distance to the north-west, which has very likely been the cause of the destruction of a good deal of the temple. The building was reconstructed by Augustus, and to this period belong, apparently, the remains before us.

To the north-east, at a deeper level, a portion of the tufa rock of the ridge of the Velia has been laid bare; it has an artificially flattened surface, with a flight of steps cut in it, while to the north-west of the temple are the remains of a large house of the late Republican period, which have a slightly divergent orientation. The greater part of this building has been exposed for some time; it has been much destroyed by the massive concrete foundations of some building of the late Imperial period.† The earlier pavement of the road ascending to the Palatine, belonging to a period previous to the erection of the arch of Titus, has been traced a little further up the hill (beneath it is a congeries of remains of drains and buildings of various periods), and that of the Nova Via is now being laid bare. It lies about 3 ft. below the late imperial or mediæval pavement, and shows surprisingly little sign of wear—unless it happened that it was "roughed" only a little while before it fell into total disuse, we may infer that it had comparatively little traffic to carry—and, indeed, the recent excavations have shown that it was a *cul-de-sac*. At the edge it seems to have been covered by a footpath of slabs of travertine, but this is hardly wide enough to account for the freshness of the surfaces of all the blocks now visible. The arches which are seen crossing the road and those which run parallel to the façade of the buildings on its south-west side* are posterior in date to this pavement, as their footings rest upon it. The drain which runs under the road is now being explored; it is crossed by drains belonging to the southern angle of the house of the Vestals, connected apparently with its enlargement in the time of the Flavian emperors (*Tribuna*, December 5).

Work has just been recommenced in the Basilica of Constantine, and the interior will be cleared down to the level of the original pavement. Some fragments of it, consisting of small pieces of coloured marbles, set in patterns, were discovered in the spring, and also fallen masses of the vaulting of the roof, the coffering being in some cases well preserved.

THOMAS ASHBY, JUN.

* July 23, p. 88; *cf.* also August 13, p. 178.

†This building is of uncertain date and nature. From its orientation, it would seem to be contemporaneous with the Basilica begun by Maxentius (which generally bears the name of Constantine, who completed it), and was very likely a portico fronting upon the Sacra Via, which thenceforth ran between it and the Basilica, and then, turning at right angles, between it and the temple of Venus and Rome.

* The chambers fronting upon the road seem to have been shops. In one of them a mosaic pavement with a fine geometric design has recently been discovered.

TWO OLD MAPS OF LONDON AND THEIR AUTHORS.

WE may opportunely devote a few words to the story, on its ichnographical side, of the two maps which the London Topographical Society will shortly issue to their subscribers. The bird's-eye view which is generally attributed to Radulph Agas possesses the greater antiquarian interest, though, regarded as a historical document, and allowance being made for its priority in respect of time, it is less valuable than the later one published by Morden & Lea. Of Agas's map—for so we must call it in default of a more authentic name—there are original copies in the Pepysian Library at Magdalene College, Cambridge, and in the Guildhall Library, London. The latter was printed without either date or scale, *temp.* James I., whose coat-arms it bears at top, yet the royal coat-arms of Queen Elizabeth are carried by the State barge. And since St. Paul's is drawn without the spire, which was destroyed in 1561, and not rebuilt, whilst The Theatre erected in the liberty of Halliwell, Shoreditch parish, in 1576 by Burbage is not delineated, we may fairly presume that the view was taken within that period. Agas was born in or about 1540 at Stoke-near-Nayland, Suffolk, and died there on November 26, 1621. He practised as a land surveyor chiefly in his native county during forty years, as he himself tells us, wrote several treatises relating to his craft, and by his own account was skilfully versed in the exercise of his calling. In the Lansdowne and the Additional MSS., British Museum, are two letters written by Agas to Lord Burghley; one, dated February 22, 1592-3, is described as "A Noate for the Perfection of Lande Measure and exact platting of Cities, Castles, Honors, Lordshippes, Maners, and Landes of all sortes," and mentions the "profitable staffe" and a theodolite of some 20 in. in diameter, with a protractor of at least 1 ft.; another describes his labours in the fen lands. His fame now rests mostly upon the views accredited to him of London, Oxford (1578), and Cambridge (1592). Examples of the latter two are in the Bodleian Library. George Vertue's fraudulent reproduction made in 1737 for the Society of Antiquaries of the London view may be rejected as untrustworthy. He inserted a date, "1560," in Roman characters, and made alterations and omissions—using some pewter plates now conjectured to be spurious. Of the copy belonging to the Corporation of the City, W. H. Overall, F.S.A., their librarian, brought out in 1874 an exact facsimile, executed by F. J. Francis; the original measures 6 ft. $\frac{1}{2}$ in. by 2 ft. 4$\frac{1}{2}$ in., and is printed from wooden blocks. Agas's map, into which he introduces many a little bit of quaint verisimilitude, has the inherent defect of combining plan and perspective, the plotting of the foreground with its buildings merging northwards into illusive perspective. But not so with the map which Robert Morden and his coadjutor, Philip Lea, published in 1682 from a survey, to a scale of 300 ft. to the inch, made by William Morgan, His Majesty's cosmographer. Morgan's work formed the basis of many subsequent plans of parishes, city wards, liberties, etc., notably those by R. W. Seale, B. Cole, R. Bloome, Thomas and John Bowles, and others, for Seymour's and Strypes's editions of Stowe's survey, Maitland's "History of London," and similar works. A copy of Morden & Lea's first edition, 7 ft. 7 in. by 5 ft. 1 in., on eight sheets, is in the Crace Collection; at the base, along the entire length, is a view, from various positions, of the town. As a specimen of cartography it is superior to the map, 1677, of the City of London, to a scale of 100 ft. to the inch, prepared by Morgan and by John Ogilby, and engraved for the most part by Hollar, who died in 1677. Of Ogilby & Morgan's map there are reprints, on eighteen sheets, 1732, by Morden & Lea, and by De Wit; and another edited by the London and Middlesex Archæological Society ten years ago. Any such detailed plotting was not again attempted for London as a whole until Robert Horwood, of Liverpool, devoted the last ten years of the XVIIIth century to the map, to a scale of 2 ft. 1 in. to a mile, he made for the Phœnix Fire Office, engraved by Ash, and published in 1795-9, for which the Society of Arts gave him an honorarium of fifty guineas in 1802. Robert Morden, who died in 1703, traded as a map and globe maker at the sign of the Atlas in Cornhill, with, for a while, his partner, Thomas Cockerill. He published a large number of county and other maps for Great Britain and Europe, and even of the West Indies and Tartary; he was the author of an "Introduction to Astronomy, Geography, Navigation, and other Mathematical Sciences," 1702, and of a description of a large quadrant constructed by H. Sutton, 1669. His maps were used for Bishop Gibson's edition, 1695, of Camden's "Britannia," and for the Reverend Thos. Cox's "Magna Britannia," 6 vols., quarto, 1720-33. With Philip Lea he brought out "An Actual Survey of London, Westminster, and Southwark," 1700, on two sheets, drawn and engraved by J. Harris; a quarto volume entitled "A Book of the Prospects of the Most Remarkable Places in and About the City of London," probably in 1700, and Hollar's map of London and the suburbs, 1675. The Corporation possess a later copy of their large map of London, which bears a dedication to William and Mary, with portraits of those Sovereigns, and was published by them at the Atlas and Hercules, Cheapside, as well as at the Atlas in Cornhill.

ANOTHER NEW STONE-WORKING MACHINE.

IN our issue of September 3 a description was given of a stone-working machine, which represents the latest advance in this country towards the replacement of costly hand labour by cheaper and more efficient mechanical methods. We are now in a position to furnish our readers with some details of an invention of somewhat similar character, but which up to the present has been used exclusively in Germany. This machine is made by Messrs. Bercher & Gerhauser, of Altengronau, and the sole British agent is Mr. A. Strauss-Collin, of London.

The machine in question is intended for moulding, planing, turning, and sawing marble, granite, syenite, and other stones. In general appearance it somewhat resembles the iron planing machine used by engineers. The front edges of the cast-iron uprights are shaped to form vertical guides, up and down which a table can be moved by means of a screwed shaft actuated by means of a hand wheel placed within easy reach of the operator. A secondary table works on horizontal guides, provided on the first table, and can be moved backwards and forwards by means of a second hand-wheel placed alongside that first mentioned. Thus it will be seen that the arrangement is akin to that of the familiar slide rest of a lathe.

To the secondary table is attached the cutting mechanism, all of which is enclosed to protect it from dust, and at the end of a shaft worked by the gear is a carborundum cutting-wheel, or a diamond circular saw,

running at from 1,500 to 1,600 revolutions per minute. By means of a hand wheel, the working shaft, with its cutting tool, can be moved through an angular distance of 180 degs. in a vertical plane, so as to suit different thicknesses of stone, or to permit the tool to be applied to any desired part of the work without changing the position of the main slide. By a simple yet ingenious device the cutting-wheel when in any position can be driven by the same belt which transmits power to the machine itself.

The table on which the work is clamped moves along horizontal guides, and has three speeds for the backward and forward strokes. The traversing motion is effected by means of worm gear fitted below the table, and adequately protected from dust, and a hand wheel is also provided for convenient adjustment.

Two attachments with which the machine is furnished deserve particular mention. The first is a device upon which circular slabs of any diameter can be finished, either plain or with ornamental moulding on the edges. This auxiliary consists of a cast-iron stand with a turntable, on which the work is fixed and rotated by a worm connected with the driving gear; it includes, further, a stand with a self-centring block, so that no previous determination of the centre is necessary. The appliance is driven by a flexible shaft actuated from the main shaft by rope transmission. The second attachment is a form of chuck to assist in the turning of small columns, balusters, vases, and other details, and in which several pieces of stone may be fixed at one time. Rotatory movement is given by means of suitable gear, so that as the chuck passes to and fro upon the travelling table all parts of the work are brought into contact with the cutting tool.

In virtue of the different motions and auxiliaries described, the machine is capable of manipulating the work horizontally, vertically, or at any desired angle, and the material to be worked may be of any length, with a width up to 80 in. and a depth up to 52 in. Moreover, the machine can be utilised for forming any required rectilinear, curved, and scalloped mouldings on slabs, irrespective of the height and width of the work.

Some idea of the rate of production may be gathered from the following statement, which refers to the formation of the shapes illustrated in the figure. These were cut in rough sawn marble slabs 2¾ in. thick. The time required for cutting mouldings in granite and syenite is proportionately longer.

No. 1....	12	minutes	per	length of 40 in.
„ 2....	5	„	„	„
„ 3....	5	„	„	„
„ 4....	3½	„	„	„
„ 5....	15	„	„	„
„ 6....	3½	„	„	„
„ 7....	11	„	„	„

The machine measures about 17 ft. long, 10 ft. wide, and about 10 ft. high. At the present time twenty machines are in operation in various German towns, and we learn that one of the leading English marble-working firms has ordered a machine, which will shortly be erected in this country.

ROYAL EXCHANGE.—On December 19 the Lady Mayoress unveiled a fresco in a panel of the south wall, painted by Mr. Edwin A. Abbey, R.A. The picture is a gift of the Merchant Taylors' and Skinners' Companies, and represents the reconciliation in 1484, after a long dispute, between the two guilds, which they commemorate by a joint feast, to the present day, yielding precedence the one to the other in alternate years.

IMPROVEMENTS AT LLANDRINDOD WELLS.—In the next session of Parliament the Llandrindod Wells Urban District Council are asking for authority to extend their waterworks, acquire land for golf links, and erect reading and refreshment rooms in recreation grounds which may be acquired. They also ask for powers to provide a town hall, public hall, assembly rooms, and other public buildings, subject to the sanction of the Local Government Board.

OPEN SPACES AND THE SANDHILLS ESTATE, ST. PANCRAS.

IT is stated that the Skinners' Company, who are owners of the property in trust on behalf of Sir Andrew Judd's Grammar School at Tonbridge, have agreed, with the concurrence of the St. Pancras Borough Council, to surrender a space 30 ft. wide along the forecourts of Nos. 45-113, Euston-road, for the bringing forward of the building line by 20 ft., as part of a scheme for the erection of a high-class hotel and improved residential property on the southern side of the main road, being of opinion that the existing forecourts "must be got rid of before any real improvement can be effected." They are prepared, further, to make over to the Borough Council the freehold of the garden in Burton-crescent for future up-keep by the Council as a public space, and freely to convey as much land as will be needed for the proposed opening out of Burton-street on the east into Duke's-road. The property of the Skinners' Company in that quarter consists of lands purchased there (and elsewhere in London) by Sir Andrew Judd for the endowment of his school (1558), and vested in them for the benefit of the school by an Act of 1572. Judd bought the land for 346*l.* 6s. 8d. from John Gates and Thomas Thorogood. In his deed of bequest to the Skinners' Company it is described as:—

"A close of pasture with the appurtenances called the Sandhills situate lying and being on the back side of Holborn in the parish of St. Pancras of the yearly value of 13*l.* 6s. 8d."

A survey of the Sandhills estate dated May 2, 1785, shows that it then consisted of grass-land, about 27 acres in extent, traversed in its northern portion by the New-road (now Euston-road), with one house and a bowling-green at the northern end of the later Thanet-street. The Sandhills estate was demised for a while at a small rent to the Duke of Bedford. In 1807 the Skinners' Company leased nearly all the land to James Burton for a term of ninety-nine years at a ground rent of 2,500*l.* per annum. Burton laid out the ground, building the streets which, with Burton-crescent, are situated within the area having Tonbridge-street along the north-east side, Leigh-street and Crescent-mews South along the south-east side, Burton-street and Crescent-mews North along the south-west side, and Euston-road along the north-west side. The outlying portion, about 5 acres, on the northern side of Euston-road has since been disposed of to the Midland Railway Company. The property, as laid out by Burton, has, from various causes, not realised the projector's expectations. The leases will terminate in 1906, and it is estimated that the new ground rents will then yield an increased income amounting to about 20,000*l.* per annum in favour of Tonbridge School. The statue, a poor thing, in Burton-crescent garden of Major John Cartwright, *obiit* 1824, is by Clarke, of Birmingham. New-road was made in pursuance of an Act of Parliament in 1755-7 as a route offering many anticipated advantages from the end of the City-road to the Yorkshire Stingo at Lisson-green, and was laid out in terms of the statute as a kind of boulevard, the houses having front gardens or forecourts along nearly the whole of its length. In its conception it might have been one of the finest streets in London; but subsequent encroachments in advance of the building line—notably in the portion now called Euston-road—and other reasons, combined with the inferiority of the near neighbourhood in the St. Pancras and Pentonville districts, have contributed to its disfigurement and degradation, so that it has failed to take rank amongst the ornamental thoroughfares of the Metropolis.

CHINGFORD PARISH CHURCH.—Some carved oak stalls for the clergy and oak desks for the choir boys have been presented to the Chingford Parish Church. The stalls are made from designs prepared by the architects of the new portion of the church, Messrs. Blomfield, and are part of a plan for choir stalls for the men and boys which it is hoped may be carried out some day.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

AT the meeting on the 14th inst. Mr. Theodore Fyfe read a paper on "The Natural Lighting of Interiors." The paper was illustrated by lantern slides of various interiors at home and abroad, and a number of photographs were also exhibited. He said that in the study of structure as evolved from plan, the importance of lighting as a means of effect was realised. In old work we often perceived that a noticeable light effect was the result of a careful study of the entire situation, often a necessity from the very nature of the case. In the Temple of Hathor at Denderah the light from the doorways penetrated a certain distance into the building. The central chambers had a few upper loopholes or slits, enough to prevent total darkness while preserving the mystery of the Temple shrine. But artificial light must also have been resorted to, even in the intense brightness of Egypt. The lighting of the Pantheon at Rome was unique in Europe, and nothing could be more majestic. The light was also perfectly adequate. In Santa Sophia, Constantinople, we got the effect of one vast and swelling hemispherical construction, so that the insistence of the strong band of windows at the base of the dome was just what was wanted to give point to the crowning feature. SS. Sergius and Bacchus, Constantinople, an eight-sided building with a sixteen-sided dome, showed beautiful lighting from small windows distributed high up. This was a feature of Byzantine churches generally. The Mohammedan tombs at Brûsa had a different ideal. The predominant note of their interiors was the decoration in coloured tiles. To get the full effect of this, plenty of light was required, and we found the windows were large, placed low in thick walls, giving deep ingoings. In the Mohammedan and Coptic work in Egypt we found something more akin to the Byzantine methods. The Coptic church at Old Cairo was a wonderful example of a dimly-lit building. Of Lombard buildings in Italy, a beautiful example was San Michele at Pavia, one of the finest interiors in Italy. The aisles, transepts, and dome were lit by small windows, high up. The feature of the Italian Romanesque east end was a circular window placed high, and this was also used with fine effect by Brunelleschi in the Badia Church, near Fiesole. In the basilican churches of Italy and Sicily, on the other hand, the east end was apsidal and unlit, the aisles being occupied by chapels with little or no light, so that the buildings were dependent on the nave clerestory windows. Fergusson had eloquently described the effect of the Buddhist rock-cut temple at Karli, which resembled the western basilica in its plan, and obtained its light entirely from a large upper opening at the entrance end. The wood roofs in Italy were occasionally well lit, as in San Stefano at Venice, where semicircular windows cut into the roof with groining. Gothic work in its complete state represented the apotheosis of the stained-glass window, and this kind of architecture scored in a double way, as the decoration of the interior was obtained not in spite of but by means of the light. Of Renaissance ecclesiastical interiors, St. Peter's was the typical example in the one-dome plan. From the entrance, the dome appeared as a great well of light. On nearer approach we saw the great light space above the pendentives spreading itself down to the giant arms of the cross. In our London atmosphere, the colonnade round the dome windows in St. Paul's was unfortunate from an interior point of view. The aisles in St. Paul's were well lit, but the most original feature in the lighting is the series of windows in the spaces above the dome side-arches. The Laurentian Library at Florence was a good example of a large civil building of Renaissance times. It showed a fine vista which suggested comparison with the King's Library at the British Museum, but in the latter the sense of length was spoiled by the break in the centre. The Vatican Library suggested a cheerful and well-lighted crypt. The windows were ample and low, so that the decoration could be properly seen. Concerning modern work, it was impossible in the limited time to do more than briefly generalise. It was desirable that we should recognise the possibilities of lighting in small churches, and avoid being governed too much by convention in such window disposal. In churches, good well-thought-out lighting went far to redeem indifferent detail. Concerning east windows, it was best to admit little light from the end, to obtain what more was necessary from the sides, and to have small

windows generally at the east end, thus approaching the Byzantine method. Light coming only from the ceiling was unwelcome in churches, as in the Madeleine at Paris, a building where the interior was sacrificed to the exterior. Wren's churches showed ingenious and good lighting for a city atmosphere. Among others too numerous to mention, St. Margaret's, Lothbury, St. Mary, Abchurch, St. Mildred's, Bread-street, Christ Church, Newgate-street, and especially St. Stephen's, Wallbrook, showed lighting that was interesting and often very effective. Domestic work was, of course, their chief concern, and they could learn much about the perfect rendering of light effects in domestic interiors from the paintings of Pieter de Hooch and Terborgh. In the town they wanted, usually, as much light as they could get, but in the country they could often revel in the more open surroundings. Some rules that might be advanced were:—Light a room entirely, or mostly, from one side; be chary of introducing windows in fireplace walls; suit windows carefully to the shapes of the rooms they occupy. During the paper reference was made to photographs on the walls of many of the examples mentioned, and in conclusion a number of slides were shown, representing some characteristic lighting at home and abroad.

The reading of the paper gave rise to an interesting discussion, in which Messrs. W. Wonnacott, H. Passmore, W. Curtis Green, Bernard Webb, W. L. Trant Brown, and the Chairman (Mr. H. Gregory Collins) took part. Mr. Henry T. Hare then summed up the discussion, as special Visitor, and said that although the subject did not lend itself to controversy in any great measure, as there could not be any hard-and-fast rules laid down, it was an important one to architects. He was glad that Mr. Fyfe had not attempted to lay down any rules, for he thought that a good many erroneous ideas were conveyed in this way. It was best to take mental notes, as they had that evening in looking at the illustrations, and then go home and think about them. He referred to the lighting of the Pantheon as the most successful he knew of, and mentioned the Picton Reading-room at Liverpool, which was most satisfactorily lighted in much the same way. The advantage of windows high up in a dome was the great diffusion of light obtainable, and the consequent small window area necessary in comparison to space lighter. Regarding domestic work, aspect and prospect considerably influenced the size and position of windows, and with reference to lighting from one side only, he was not a believer in this, as he knew of many successfully-lighted buildings where side and end light were combined, notably in some of Mr. Norman Shaw's work. The fixed rules for ratio of window to floor area, as determined and enforced by local and other authorities, were a great source of trouble—and to no good purpose.

Mr. Fyfe briefly replied, and the meeting then terminated.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The third meeting of this Society for the present session was held in the Law Library, Cook-street, on the 19th inst. Mr. John Murray read a paper, illustrated by lantern slides and drawings, on "Scotch Plaster Work of the XVIth and XVIIth Centuries." He discussed a number of decorated ceilings of the period found in Scotch castles and country houses, and in the old town houses of Edinburgh, and showed the influence of Italian and French taste and the gradual increase of richness in the ornament. The work of the XVIIth and early XVIIIth centuries was largely that of Adam or of his son. All the modelling was hand-wrought. In conclusion, Mr. Murray insisted on the importance of artistic plaster work in interior decoration. It was at least as important as decoration in wood or metal.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—On the invitation of the Chairman, Mr. Samuel Cutler, junr., M.I.Mech.E., a large number of the members of this institution recently visited the International Gas Exhibition at Earl's-court. They were received by Mr. J. W. Helps, M.Inst.C.E., Chairman of the Advisory Committee of the Institution of Gas Engineers, under the auspices of which the exhibition was held, and shown over by him and Mr. S. Y. Shoubridge, of the South Suburban Gas Company, Mr. A. E. Broadberry, of Tottenham, and Mr. A. W. Onslow, of the Royal Arsenal, Woolwich.

COMPETITIONS.

INFECTIOUS DISEASES HOSPITAL, SETTLE.—Six sets of plans, submitted by as many architects, in connexion with a proposed infectious diseases hospital for the Settle district, were rejected on the 20th inst. by the Settle Rural District Council as being too elaborate. It was agreed to pay the architects who had been invited to send plans a solatium of five guineas each, and the Council decided to entrust the erection of the hospital to the Sanitary Engineer (Mr. T. A. Foxcrott). The Council think that 4,000*l.* will be quite enough to spend.—*Yorkshire Post.*

MUNICIPAL OFFICES AT BRIXTON.—The following are the conditions as adopted by Lambeth Borough Council on Thursday, December 22, for the competition in respect to the erection of municipal offices at Brixton-hill; Mr. Hare assessor:—(*a*) That the competition be open to all architects, in accordance with the principle laid down by the Institute in clause 5A of its Suggestions; (*b*) that in the instructions governing the competition, a clause be inserted to the following or similar effect, namely:—

"It is the intention of the Council to appoint the author of the design placed first by the assessor as the architect for the work, unless a sufficient reason exists to the contrary."

(*c*) That a prize be awarded and paid to each of the two authors whose designs are placed second and third in order by the assessor; the first of such prizes to be the sum of 200*l.*, and the second of such prizes to be the sum of 100*l.*; that no extra premium (over and above the regular commission) be paid to the author of the design placed first by the assessor; and that the three designs, so placed first by the assessor, be the property of the Council; (*d*) that the architect selected to carry out the accepted design be paid in accordance with the Schedule of Professional Charges, sanctioned by the Royal Institute of British Architects; (*e*) that if part only of the design be carried out, the architect be paid a sum to be agreed upon in respect of the deferred portion of his design, such sum to merge in the schedule fees upon completion of the buildings; (*f*) that in the event of the Council giving no instructions within twelve months to proceed with the work, the selected architect be paid a sum of 300*l.*, such sum to merge in the regular commission when the work is taken up; (*g*) that in the event of the Council abandoning the proposed work, the selected architect be paid a commission upon the estimated cost of the building at a rate of 1¼ per cent.; (*h*) that the Institute's Suggestions numbered 4 and 6, as to drawings, be incorporated in the instructions to be issued by the Council; (*i*) that a deposit on the supply of instructions be required from every applicant, the assessor to suggest the amount of such deposit; such deposit to be returned on the receipt of a *bonâ-fide* design, or if the applicant declines to compete and returns the instructions, within a month after their receipt; (*j*) that a declaration be required from every competitor stating that the design is his own personal work, and that the drawings have been prepared under his own supervision; (*k*) that the five reasons put forth by the Institute in Suggestion No. 9, for the exclusion of designs be adopted; (*l*) that, with the consent of their respective authors, the designs submitted in the competition, except any design excluded under clause 9 of the Institute's Suggestions, be publicly exhibited after the assessor has made his award, and that the award be published at the time of exhibition.

PROPOSED TOWN HALL AND BATHS, WIGAN.—The Wigan Corporation propose, in their Omnibus Bill which they are promoting, to take land for the erection of a town hall, municipal offices, court-house, police stations, public baths, etc. The estimate for the site and building of the town hall and offices is 85,000*l.*, and for the furnishing of the buildings 5,000*l.* For the purchase of land and erection, furnishing, and fitting up of the baths, the estimate is 10,000*l.* In addition they propose to spend 4,000*l.* on street improvements, 31,000*l.* on tramways, and 30,000*l.* under the Public Health Act.

Correspondence.

GLASGOW INSTITUTE OF ARCHITECTS.

SIR,—I have been instructed to send you the enclosed letter regarding "presentations on the occasion of the laying of foundation-stones and other ceremonies," and my Council hopes that, as the matter is of general interest, you will be good enough to insert it in the next issue of your journal.

December 22. C. J. MACLEAN.

*** The following is the circular letter referred to:—

"115, St. Vincent-street, Glasgow,
December 22, 1904.

DEAR SIR,—The Council of the Institute has had under consideration the apparently increasing prevalence of valuable presents being given on the occasion of the laying of foundation-stones or formal opening of buildings by the architects concerned to those officiating, and even in some cases to their wives or relatives.

In such circumstances, and where the importance of the building warrants it, the presentation of a trowel or key by the contractors is often expected, and the action of the architect in co-operating in such cases, either financially or by designing and selecting the article, as also in representing those concerned at the presentation, is in no way criticised by the Council.

Anything beyond this, however, is considered objectionable, as setting up between architect and client a wrong relationship of donor and recipient, and as unfair to many of the profession in encouraging rivalry as to the importance and value of the respective gifts.

Such, after due consideration, being the unanimous feeling of the Council, it has been thought desirable to place these views before the members of the Institute generally, and to ask their co-operation in discouraging the practice referred to, the Council being assured that members will not only recognise the validity of its objections, but welcome its support in this matter.

In name and on behalf of the Glasgow Institute of Architects.

C. J. MACLEAN, Secretary."

*** We are glad to publish the letter of the Glasgow Institute as they ask us to do so, and as we entirely agree with the opinion expressed; but we must add that we are not aware of any such practice in England (as distinct from Scotland); at all events, if it exists south of the Tweed, the fact has never come within our knowledge.—ED.

FERRO-CONCRETE.

SIR,—Reinforced or ferro-concrete systems of construction, although especially suitable for use in the erection of fire-resisting buildings, do not supply any new principle for protection against the action of heat; therefore, precautions, shown by experience to be necessary to secure fire-resisting qualities in other methods, must also be observed when erecting buildings with these newer systems, if protection against the action of fire is required.

The precautions referred to are now well known, being chiefly:—

(1) The use of incombustible materials that do not change to any important extent under the action of fierce heat and sudden cooling by powerful streams of water, and of careful workmanship properly applied.

(2) Complete encasement of all constructional metal, with a non-conducting fire and water-resisting substance not less than 2 in. in thickness, secured so as to retain its position under the action both of great heat and streams of water.

(3) Limitations of buildings, or their securely separated compartments, to a moderate area and capacity, regulated by the nature of their contents.

(4) Protection from fires may occur outside the fire-resisting building.

It will be a great misfortune if, by taking liberties with these new systems of applying materials, they become discredited, as is now the case with earlier forms of so-called "fire-proof" structures, which practical firemen have found, when their contents are freely burning, to be the most dangerous and difficult buildings they meet with.

The importance of these precautions was shown in the case of the Fidelity & Guarantee Company's building, No. 111, East German-street, Baltimore, involved in the conflagration of February last. Part of this building, having basement, four stories, and attic, covering a ground area of 1,700 super. ft., was constructed in ferro-concrete, broken granite being used for the aggregate, with the result that exposed angles of the concrete in piers and beams, where subject to considerable heat, split off, exposing long lengths of the metal reinforcing rods.

With a continued high temperature, which may be the case when the stories of a building filled with combustible goods take fire, the tensile resistance of the metal would be seriously weakened, unless duly protected, leading probably to collapse. The action of

the concrete under heat also shows that better results would be obtained by rounding off all external angles in place of finishing them with a sharp arris.

In August, 1903, a fire test was made of a floor formed with reinforced, trussed, hollow concrete beams placed side by side; 5-16 in. iron reinforcing rods were embedded in the concrete, which was composed of sand and Portland cement, three to one; the thickness of concrete, from its surface to the metal rods, was about ¾ in. The floor was loaded equal to 224 lb. per foot.

When the temperature had reached 1,940 deg. Fahr., to which it had been raised from 64 deg. in 105 minutes, five out of the fifteen beams included in the test collapsed.

J. SHEPPARD.

December 5, 1904.

LONDON ANTIQUITIES: COLLECTION AND GUARDIANSHIP.

SIR,—At a recent meeting of the London Topographical Society, Mr. Hilton Price referred to a collector of antiquities by James Smith, a "costermonger" who made large collections of antiquities and sold them entire when he could not store any more. I am informed that he was a Whitechapel dealer in old iron, etc., who was well known to excavators, and promised them good value for any articles discovered, of the genuineness of which he was a good judge.

It is indeed a matter of surprise that such a subject should have engaged the attention *con amore* of an illiterate man like "Totty Jim," the cognomen he acquired from the bag attached to his barrow for the deposit of the relics he bought. I understand that some of the "finds" are now in the Guildhall Museum, but cannot say anything of their description or importance; perhaps some of your readers can give information and say whether his collection was dispersed at his death. It seems strange that there is no official arrangement for securing all objects found in each borough, and that it should be possible for an amateur like Smith to make large collections.

Whether from want of space or of interest, it would seem as if there is no great anxiety to add to the City collection, nor much care shown in exhibiting and cataloguing it. Several years ago Mr. Longman, of Whitechapel, presented an interesting piece of sculptured Purbeck marble found on the site of Holywell Priory, Shoreditch. It is part of an effigy of a mediæval bishop from a table tomb, in the left hand the crozier staff and the right hand upraised in the act of benediction, both being gloved. It had a small corbel on one side of the shoulder with an unmistakable Gothic cap, a roll and hollow round the edge, and faint traces of colour in the folds of the drapery.* After lying for a long time without a descriptive ticket, it is now labelled "Portion of a male figure, *probably Roman*"! Another object, part of a XIVth century Gothic door jamb, is labelled "Portion of a fluted column, *Roman period*"! In the elaborately-illustrated catalogue, priced 1s. (and I am told some years in preparation) one would hardly expect any *Roman-cing*.

If this letter is not already too long, I should like to add that it is gratifying to antiquaries to find recently more toleration on the part of architects towards this study, which has been the subject of much cheap disparagement from some who, I fear, mistake oddity for originality in design. As witness, I would name a recent meeting of the A.A. when papers read were of an entirely antiquarian character. Can it be the unsuspected influence of the old Revivalists which lingers still around the spot that was the centre of their hope for a permanent school of English architecture which should push out the exotic from Italy for ever?

E. W. HUDSON.

ARCHITECTS' DRAWINGS.

SIR,—Your repeated advice to architects to join together with a view to obtaining a satisfactory judgment on the principles involved in the Gibson *v.* Pease case ought to bring about the desired result, though the lethargic isolation of architects referred to by "A Provincial Architect" is anything but a negligible factor.

The question of drawings has been in an unsatisfactory state so long that it is specially desirable that the present opportunity of righting it should not be allowed to slip.

My own practice is to insert a clause in every specification as hereunder given, and I have been able to point to it on more than one occasion with satisfactory effect. The clause reads thus:—

"All drawings, tracings, specifications, quantities, papers, and copies thereof whatsoever are, and will remain, the property of the architect, and any given to the contractor must be returned to the architect in reasonably good condition on demand or otherwise at completion of the works."

I enclose cheque of 1*l.* 1s. towards the appeal.

G. A. HUMPHREYS.

* See sketch in R.I.B.A. Journal, vol. v., p. 234.

SIR,—As a careful reader of your valuable paper for the last twelve years I have constantly noted the curious lack of appreciation of the position of the profession as evidenced in your legal reports.

The present opportunity of endeavouring to vindicate our right to our drawings is one which must not be allowed to pass, and I trust that your spirited action in this matter may receive the support of all architects—whether members of the Institute or not.

I therefore have pleasure in enclosing cheque herewith for 2*l.* 2s. as the contribution from QUARTER SCALE.

*** We have received contributions from various architects towards what we will call the "Architects' Defence Fund" (including ten guineas from Mr. A. W. S. Cross and the same sum from Mr. Hubbard), which have been acknowledged by letter, but we should like a longer list of subscribers before publishing it formally. We have more to say on the subject next week.—ED.

FAMAGUSTA.

SIR,—I have just recently seen a copy of the *Builder*, of date July 9, 1904, and have been much interested in the article on the churches in Famagusta, Cyprus, from which country I have recently returned home. I have some full-plate photographs of the ruins of Famagusta, which I shall be pleased to lend you for reproduction in your paper if you so desire.

The correspondent who wrote the article is, I think, somewhat mixed in his description of the various churches. *The* Cathedral of Famagusta (of which no mention is made) is Santa Sophia, built 1300-1312, now used as a mosque. It was, when a Latin church, called St. Nicolas. The church of which a plan and elevation are given on pages 32 and 33 is now almost a complete ruin, practically only the end walls standing. The church which is now used as a grain store, and which is the most complete, is known to the Greeks as SS. Peter and Paul. The church shown on pages 32 and 33 is dedicated to St. George, the patron saint of the island. All the churches were Christian, and at the Turkish Conquest, in 1570, the Church of St. Nicolas was turned (probably then) into a mosque, and called by them Santa Sophia. The same fate has happened to the once Christian Cathedral of Nicosia.

FROM CYPRUS.

THE JOINERY TRADE.

SIR,—I am very glad to see the letters in the *Builder* of "A Shop Foreman" and "Mill Foreman" respecting the above, as it shows they take an interest in their trade. On reading these, I do not think I was explicit enough in my letter to you, which appeared in your issue of December 3. My reference was to the foreign-made doors, and sashes, and frames of which we see so much used in the houses now being erected by the speculative builders on the new building estates in the suburbs, not to doors, and sashes, and frames made to the architect's detail drawings.

I will now give my experience. I have built several blocks of model dwellings, in which there have been used some hundreds of 2 ft. 6 in. by 6 ft. 6 in. 1½ in. yellow deal, four-panel, framed square both sides, doors; some thousands of feet of 1½ in. yellow deal-cased frames, oak sunk and weathered sills, ovolo sashes, double hung with iron pulleys. The quotation I received for these doors, foreign made, was 5s. 6d. each, and 4½d per ft. for the sashes and frames. I made several hundred of the doors in my own shops, also several hundred feet of the sashes and frames, but failed to get them out at the figure quoted by foreigners. Are "J. C. W.," "A Shop Foreman," or "Mill Foreman" able to do so? I did not work piecework, the foreigner does.

A LONDON BUILDER.

QUEEN VICTORIA MEMORIAL, LIVERPOOL.—The executive committee of the Memorial Fund have inspected and approved the clay model of the statue designed by Mr. C. J. Allen, of Liverpool, and decided that the model should be sent to the founders for the casting of the statue.

Illustrations.

THE ROOD LOFT OF THE CATHEDRAL OF SAINT JOHN, BOIS-LE-DUC.

THIS *jubé* is now preserved in the Victoria and Albert Museum, South Kensington, where it was re-erected in 1871. It formerly stood at the crossing of the Cathedral of Saint John (St. Jans-kerk) at 'S Hertogenbosch. 'S Hertogenbosch (called by the French Bois-le-Duc) is the capital of the province of North Brabant, Holland. The Cathedral is one of the three most important mediæval churches in Holland, the other two being the Cathedral of Utrecht and the Church of St. Nicholas at Kampen, both of which it surpasses in richness of treatment. The greater part of the present building was commenced in 1418, at the time of the rule of the Dukes of Burgundy, a period memorable in the history of Low Country architecture (*vide* "De St. Janskerk te 's hertogenbosch," 1900). In the year 1517 the work was completed; and about a century later, when the Gothic manner of building had been entirely superseded by that of the Renaissance, the rood loft that forms the subject of Mr. Swarbrick's drawings was erected. The materials employed were alabaster, with black and red marbles.

In the article entitled "La Cathédrale Saint-Jean à Bois-le-Duc (Hollandé)," by J. C. A. Hezenmans, in the "Bulletin Monumental" (vol. xxxix., 1873, page 631), it is stated that the original *jubé* was damaged by the Iconoclasts in 1566, and demolished in 1610, in order that the Renaissance *jubé* might be erected. "This, in turn," added the writer, "was unfortunately destroyed at the instance of some unintelligent people a few years ago; I regret its loss in spite of the unhappy effect of its colossal proportions on a church whose general aspect gave an impression of elegance and lightness." An earlier contribution by Monsieur Charles Piot, entitled, "Le Jubé de la Cathédrale de Bois-le-Duc (Pays-Bas)," appeared in the "Bulletin de la Commission Royale des Monuments" (Bruxelles, vol. vi., 1867, page 43); and was accompanied by a lithograph of the *jubé* in its former position in the church. In this article the reasons for its demolition were stated and some particulars of the structure itself given. The twelve chandeliers of copper were attributed to Antony, son of John, beater of copper at Bois-le-Duc; and the shields held by some of the figures are stated to have been formerly enamelled. According to Maubuchius ("Beschrijving van Sint-Janskerk te 's Hertogenbosch," page 57), it is stated the subject of the enamelled decoration was the Spanish coat-of-arms. Extracts obtained from the Bois-le-Duc archives, through Dr. Cuypers, are also stated to show that the sculptor of the rood loft, Conrad van Nuremberg of Namur, received the citizenship of Bois-le-Duc in 1608. He was probably a son of Conrad, master-mason to the County of Namur (1571-1594). Two designs, it appears, were suggested for the Renaissance rood loft, and the one copied from the structure at Antwerp, by Raphael Vanden Broeck, was accepted on December 13, 1610. It is also recorded that Van Nuremburg received the contract on December 21 of the same year, and that the work was finished in 1613.

The drawings are by Mr. J. Swarbrick, of Manchester, and obtained the Royal Academy prize this year for architectural drawing.

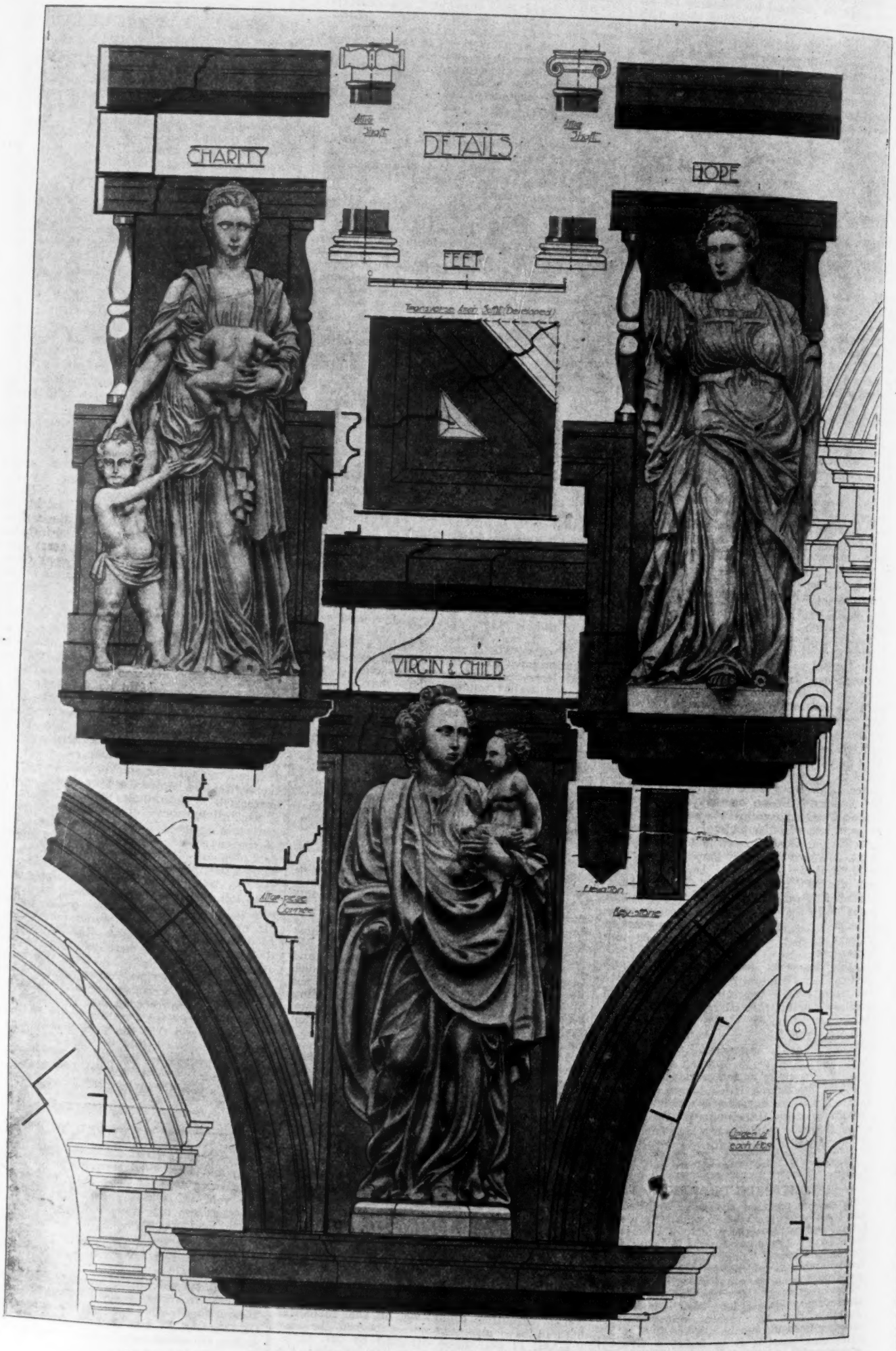
HOUSE AT MUNSTEAD, SURREY.

THE house is faced externally with Bargate stone and Portland cement rough cast, Bath stone being used for the window mullions, etc. The roof is covered with local tiles. The chimneys are red brick in small courses.

The builders were Messrs. Wm. Johnson & Co., of Wandsworth Common, S.W., and other work was executed by the following firms:—

Plumbing and heating apparatus by Messrs. Wenham & Waters (Croydon); sanitary work, Messrs. Doultons; casements, Messrs. Crittal & Co. (Braintree); lead glazing, Messrs. H. Hope & Son (Birmingham); and all metal work by Messrs. Ramsden & Carr (Fulham).

Mr. E. W. Mountford is the architect.



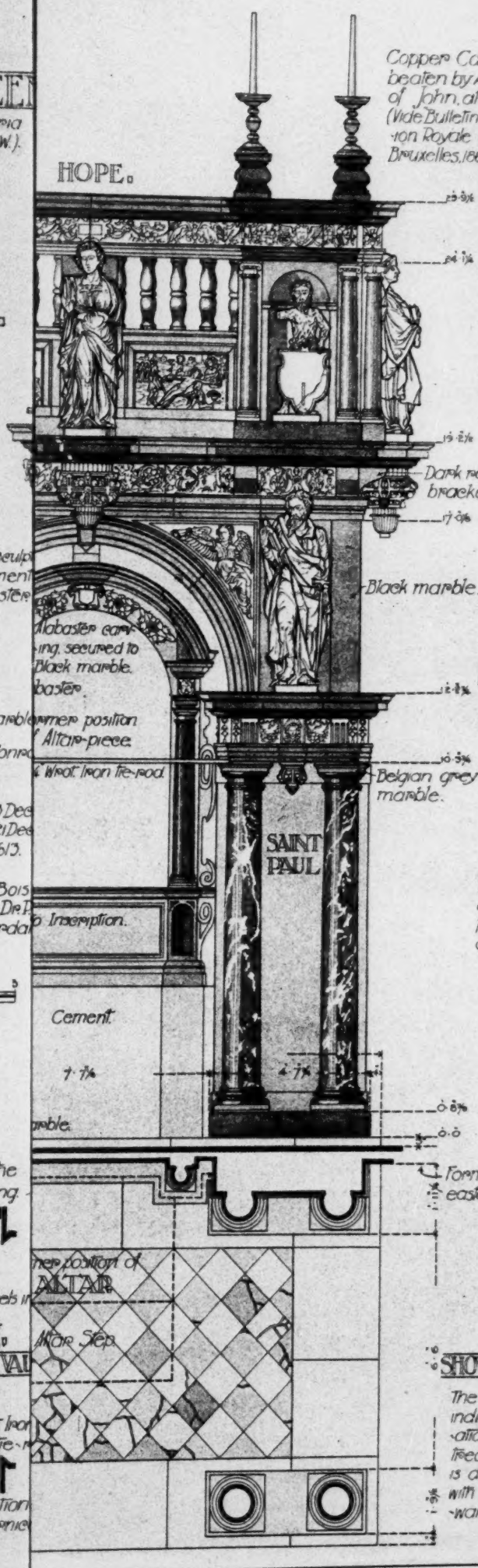
Details of Screen, St. John's Church, Bois-le-Duc. Drawn by Mr. J. Swarbrick, A.R.I.B.A.

ROOD-SCREEN

(Now preserved in the Victoria and Albert Art Museum, S.W.).

CATHEDRAL of ST. JOHN at BOIS-LE-DUC.

'S Hertogenbosch (French-Bois-le-Duc) is the capital of the province of North Brabant, Holland.


HOPE.
Copper Candelabra, beaten by Antony, son of John, at Bois-le-Duc. (Vide Bulletin de la Comission Royale des Monuments." Bruxelles, 1867.)
Alabaster capitals.
Dark red marble balusters.
Pink marble shafts.
Alabaster bases.
Dark red marble brackets.
Black marble.
The former jubé was damaged by the Iconoclasts in 1566, and demolished in 1610. (Vide "Bulletin Monumental," 1873, and "De St. Janskerk te 's-Hertogenbosch," 1900.)
Belgian grey marble.
SAINT PAUL
Cement.
7' 7⅛"
4' 7⅛"
Former position of the eastern pier at Crossing.
Former position of the eastern pier at Crossing.
Former position of ALTAR.
Altar Step.

The whole of the sculp and carved ornament executed in Alabaster.

Alabaster carving, secured to Black marble. baster.

Black marble former position f Altar-piece.

The sculptor was Conra de Nurenberg.

Design accepted 13 Dec Contract signed 21 Dec Work finished in 1613.

(Extract from the Bois Duc Archives, by Dr. P. Cuypers, of Amsterdam.

Wrot. Iron tie-rod.

Inscription.

FEET.

The whole of the mouldings, etc, have been reduced from accurate full-size details.

SECTION OF THE TRANSVERSE ARCHES.

Alabaster panels in

The vaulting ribs are executed in oolite limestone. The filling of all the severies is coated with cement.

Black marble.

1¼" × 1¼" Wrot. Iron Tie-Rod

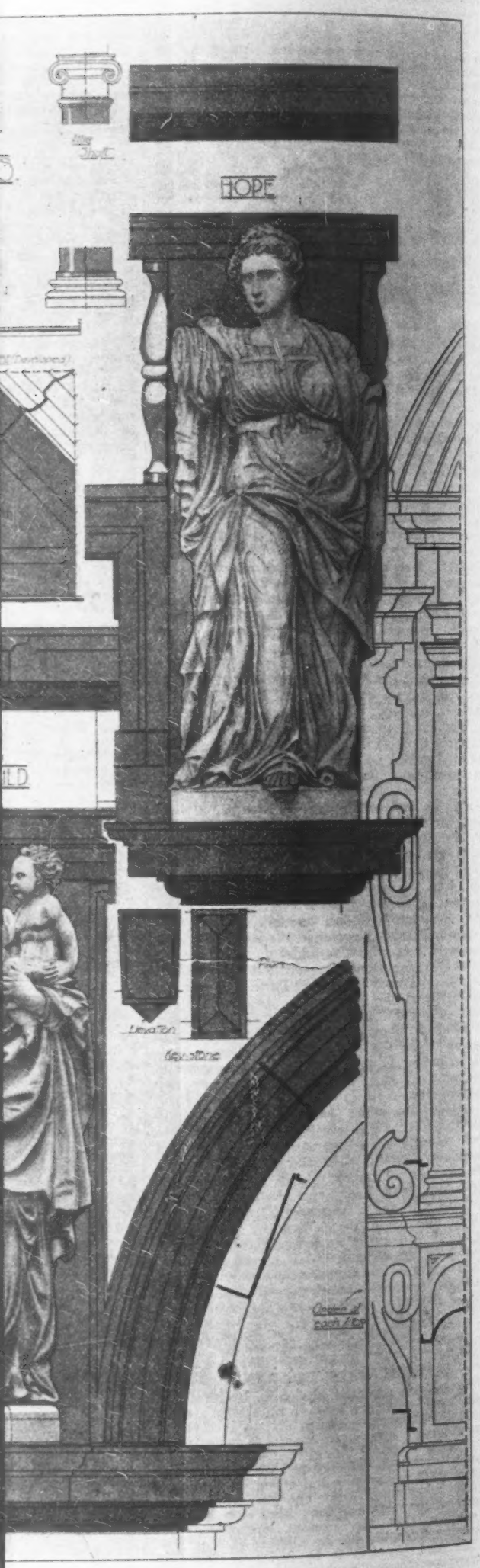
The projection of lowest cornice

PLAN, SHOWING VAULTING.

PLAN, SHOWING PAVEMENT.

The tiled pavement indicated is a restoration of the original treatment. The floor is at present paved with modern earthenware tesserae.

"INK-PHOTO," SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



Drawn by Mr. J. Swarbrick, A.R.I.B.A.

ROOD-SCREEN.

(Now preserved in the Victoria and Albert Art Museum, S.W.).

CATHEDRAL of ST. JOHN at BOIS-LE-DUC.

'S Hertogenbosch (French-Bois-le-Duc) is the capital of the province of North Brabant, Holland.

The whole of the sculptures and carved ornament are executed in Alabaster.

Black marble

The sculptor was Conrad de Nurenberg.

Design accepted 13 Dec. 1610. Contract signed 21 Dec. 1610. Work finished in 1613.

(Extract from the Bois-le-Duc Archives, by Dr. P.J.H. Cuypers, of Amsterdam.)

0 1 2 3 4 5
FEET.

FAITH.

Plaster

Former position of Altar-piece.

1¼"-1¼" Wrot Iron Tie-rod

Dark red marble.

SAINT PETER

VIRGIN AND CHILD

DEO · OPT · MAX · ...

Cement

4·7½

7·6

4·7½

Former position of the eastern pier of Crossing.

SECTION OF THE TRANSVERSE ARCHES.

Alabaster panels inlaid.

PLAN, SHOWING VAULT.

The vaulting ribs are executed in oolite limestone. The filling of all the severies is coated with cement.

Black marble.

1¼"-1¼" Wrot Iron tie-rod

The projection of lowest cornice

Former position of ALTAR.

Carved pendant, forming central boss.

Radius of the intrados of diagonal rib.

W.I. Tie-rod 1¼"-1¼"

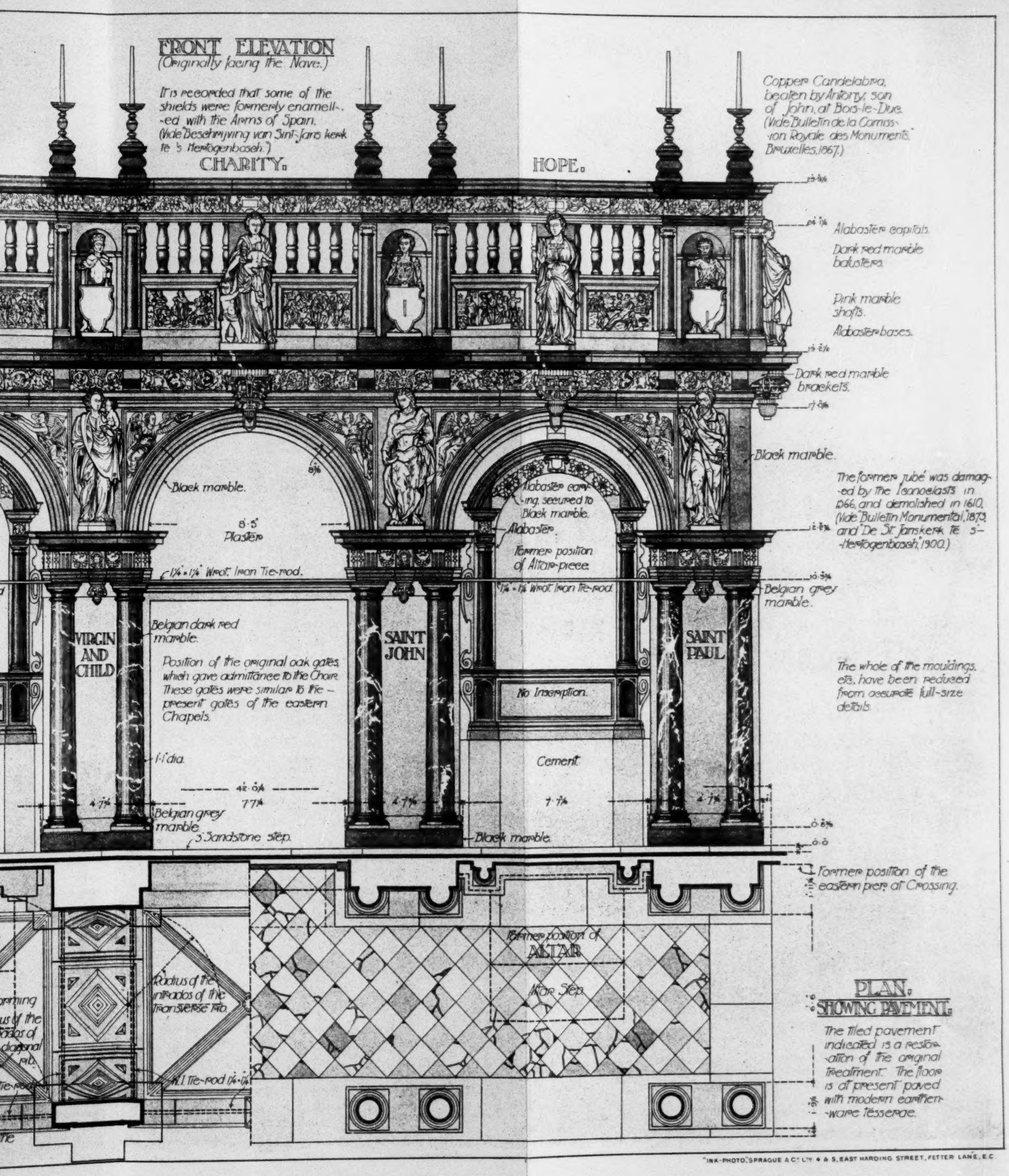
Impost level.

1¼"-1¼" Wrot Iron Tie-rod

Radius of the intrados of the longitudinal rib.

ROOD SCREEN, ST.

Royal Academy Silver Medal, 1904.


FRONT ELEVATION
(Originally facing the Nave.)
It is recorded that some of the shields were formerly enamell-ed with the Arms of Spain. (Vide "Beschrijving van Sint-Jans kerk te 's Hertogenbosch.")
CHARITY.
HOPE.
Copper Candelabra, beaten by Antony, son of John, at Bois-le-Duc. (Vide "Bulletin de la Comiss-ion Royale des Monuments," Bruxelles, 1867.)
Alabaster capitals.
Dark red marble balusters.
Pink marble shafts.
Alabaster bases.
Dark red marble brackets.
Black marble.
The former jubé was damag-ed by the Iconoclasts in 1566, and demolished in 1610. (Vide "Bulletin Monumental," 1873, and "De St. Janskerk te 's-Hertogenbosch," 1900.)
Black marble.
8·5" Plaster
1¼" - 1¾" Wrot. Iron Tie-rod.
Alabaster casing, secured to Black marble.
Alabaster.
Former position of Altar-piece.
1¼" - 1¾" Wrot. Iron Tie-rod.
Belgian grey marble.
VIRGIN AND CHILD
Belgian dark red marble.
Position of the original oak gates, which gave admittance to the Choir. These gates were similar to the present gates of the eastern Chapels.
SAINT JOHN
SAINT PAUL
No Inscription.
The whole of the mouldings, etc., have been reduced from accurate full-size details.
1-1" dia.
Cement.
Belgian grey marble.
3" Sandstone step.
Black marble.
Former position of the eastern piers at Crossing.
Former position of ALTAR
Altar Step.
Radius of the intrados of the Transverse Rib.
N.I. Tie-rod 1¼-1¾
PLAN, SHOWING PAVEMENT.
The tiled pavement indicated is a restor-ation of the original treatment. The floor is at present paved with modern earthen-ware tesserae.

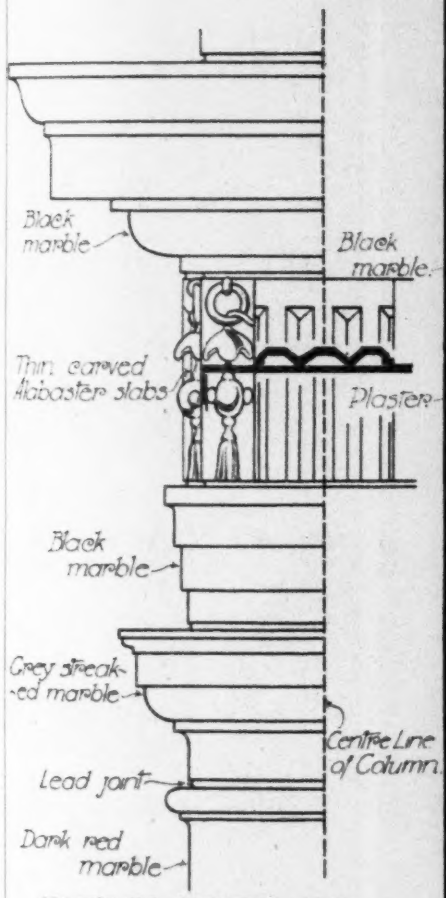
"INK-PHOTO," SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ROOD SCREEN, ST. JOHN, BOIS-LE-DUC.—Drawn by Mr. J. Swarbrick, A.R.I.B.A.

ROOD-SCREEN

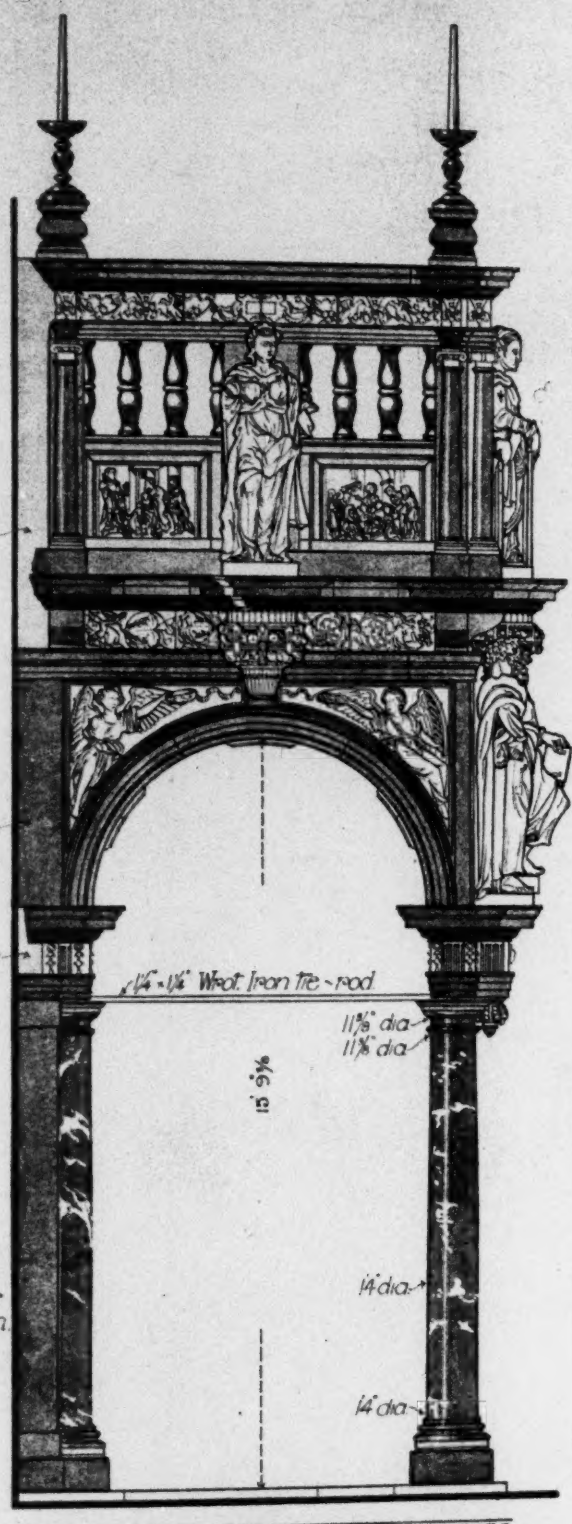
(Now preserved in the Victoria and Albert Art Museum, S.W.)

CATHEDRAL of ST. JOHN at BOIS-LE-DUC.



ENTABLATURE AND CAPITAL OF PRINCIPAL ORDER. (⅛FULL SIZE).

FEET.



ELEVATION, FORMERLY FACING NORTH.

Two designs were originally suggested. The one executed was selected from these. It is stated to be a copy of a structure at Antwerp, by Raphael Vanden Broeck.
(Vide M. Charles Piot, in "Bulletin de la Commission Royale des Monuments," Bruxelles, 1867.)

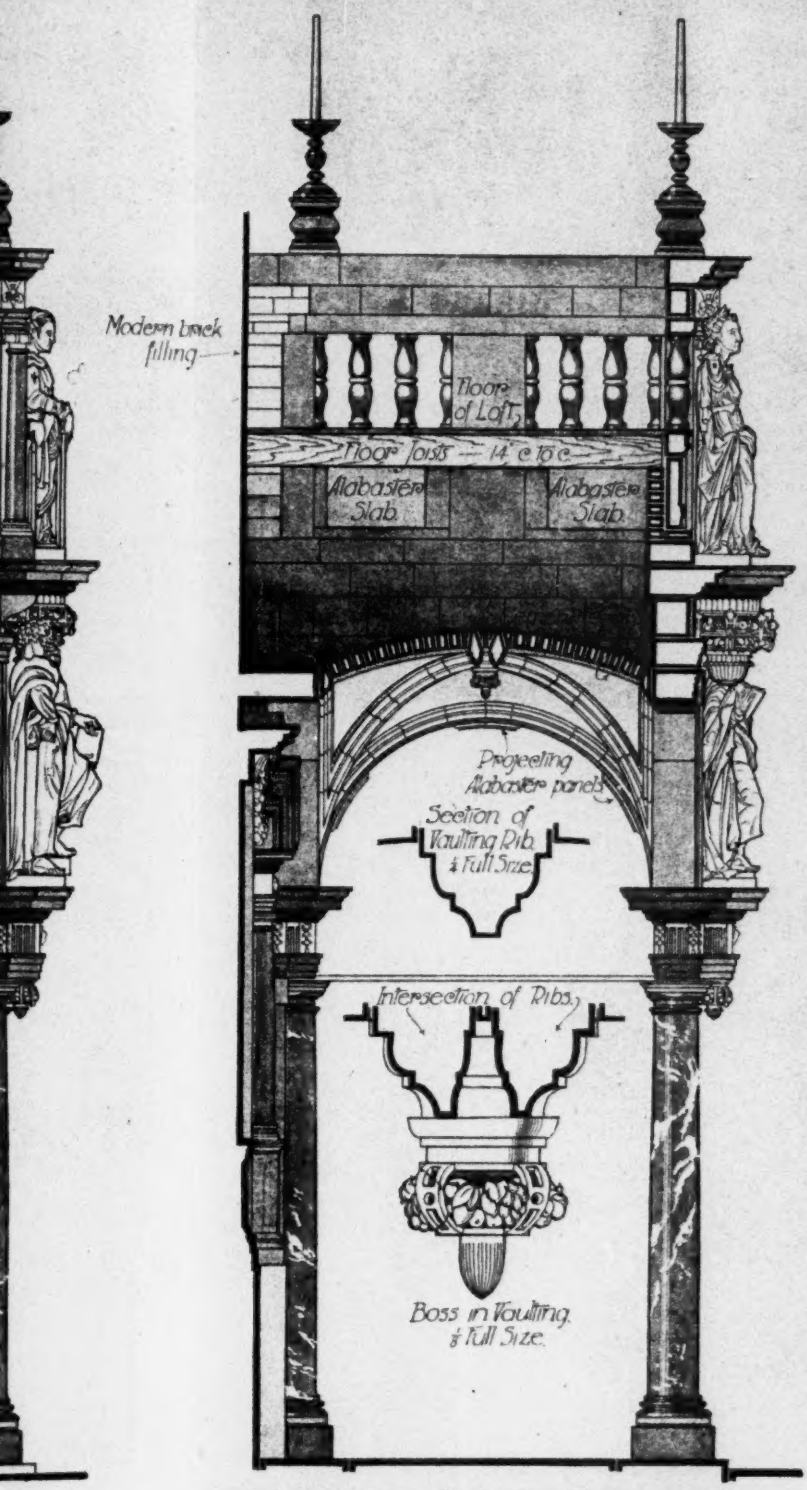
TH

D

ET DIVÆ VIRGI

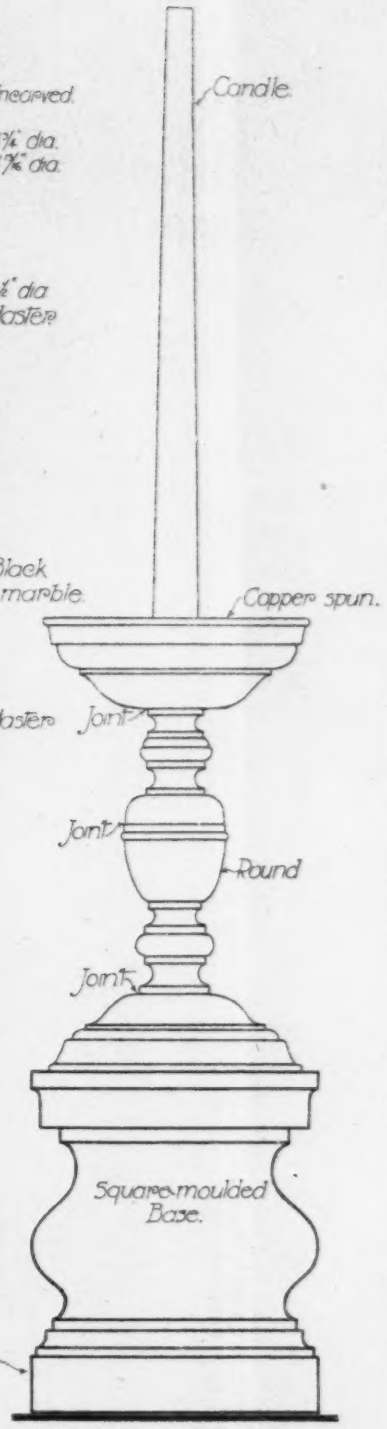
DAMIANO MAR

ZELO, CHIRVRG


Modern brick filling
Floor of Loft
Floor Joists — 14" c to c.
Alabaster Slab.
Alabaster Slab.
Projecting Alabaster panels
Section of Vaulting Rib ½ Full Size.
Intersection of Ribs.
Boss in Vaulting. ½ Full Size.

SECTION, FORMERLY LOOKING SOUTH.

ELEVATION, FORMERLY FACING SOUTH.



CANDELABRUM. ⅛ FULL SIZE.

The whole of the mouldings, etc, have been reduced from accurate full-size details.

THE ALTAR INSCRIPTION (⅛ FULL SIZE).

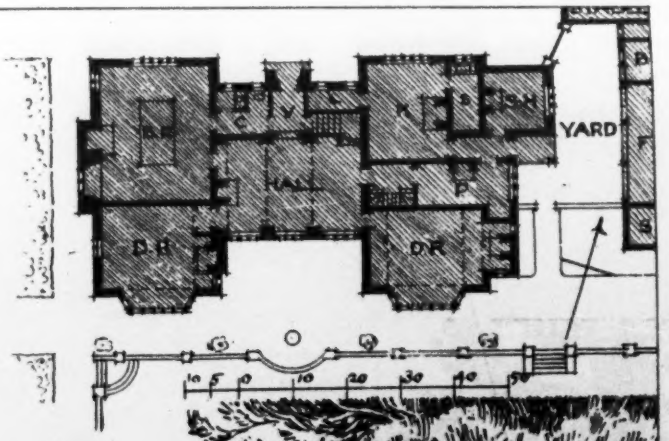
DEO ⬩ OPT ⬩ MAX ⬩

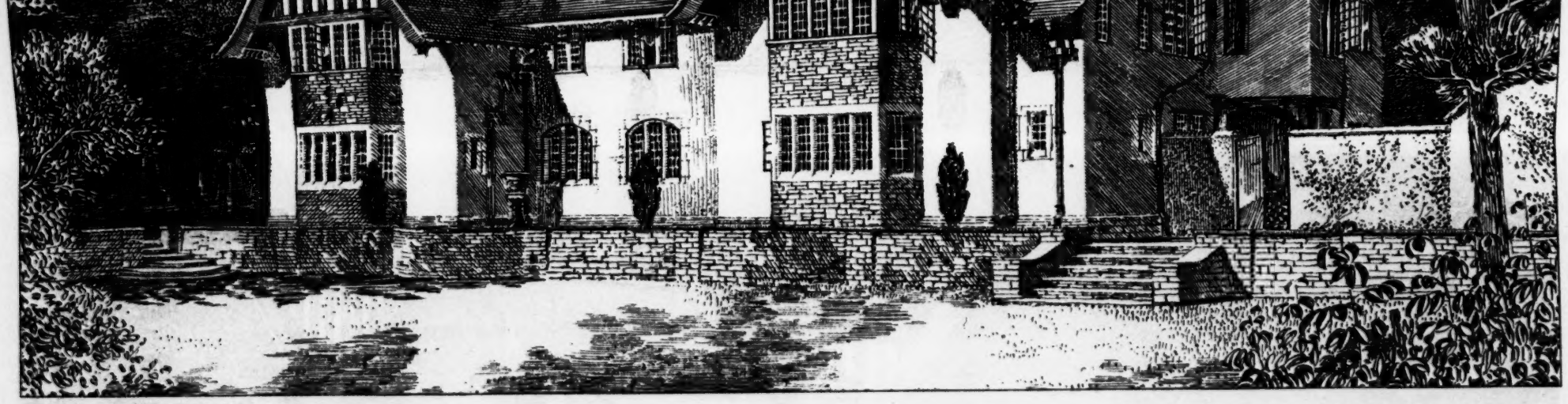
DIVÆ VIRGINI MARIÆ, SANCTISQ COSMÆ ET
MIANO MARTYRIBVS, HOC ALTARE AMORIS, PIETATISQ
O, CHIRVRGI BVSCODVCENSES POSVERE, A° 1675

"INK-PHOTO," SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ROOD SCREEN, ST. JOHN, BOIS-LE-DUC.—DRAWN BY MR. J. SWARBRICK, A.R.I.B.A.

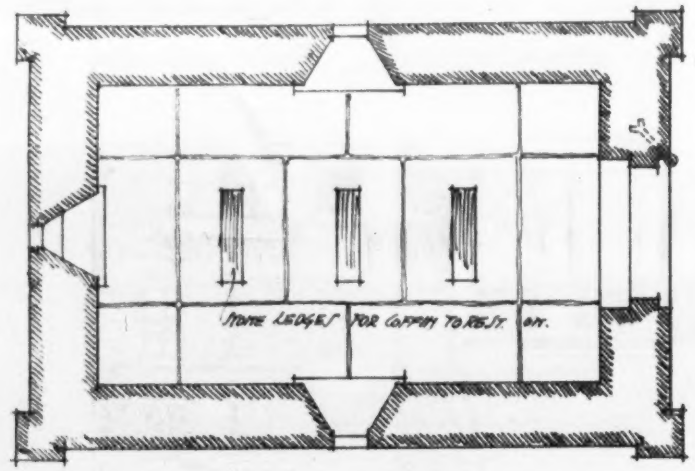
MUNSTEAD GRANGE
SURREY. E.W. MOUNTFORD, ARCHT.





HOUSE AT MUNSTEAD SURREY
E.W. MOUNTFORD ARCHT.

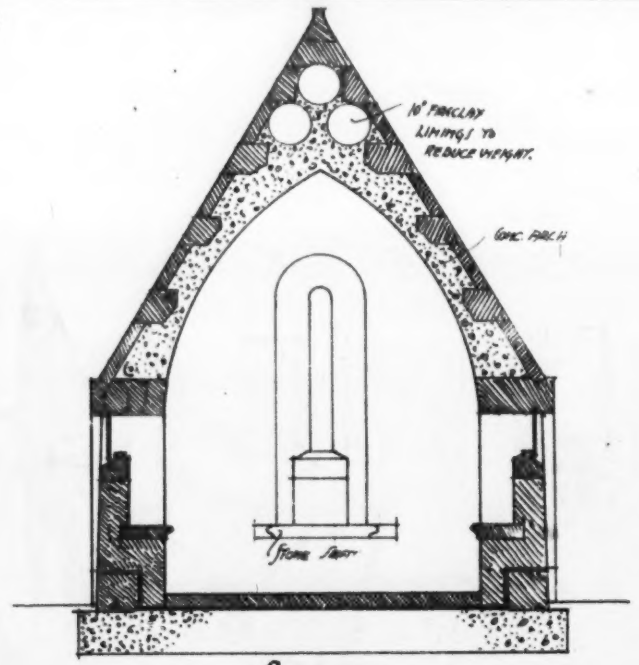
PHOTO-LITHO. SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



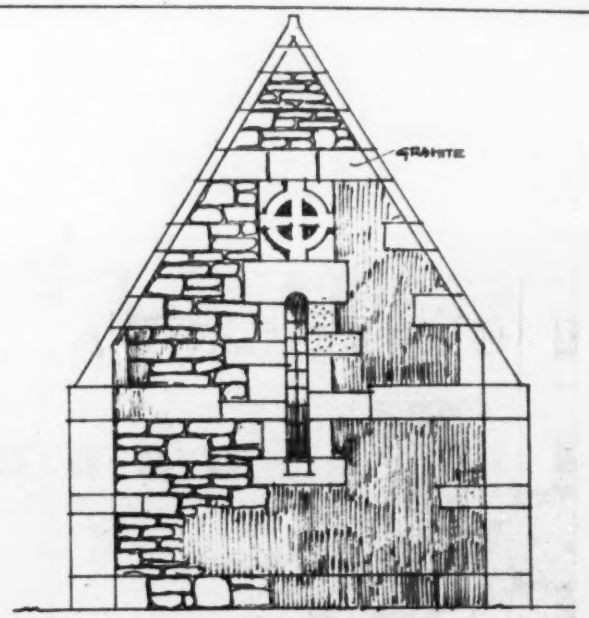
GROUND PLAN

SCALE

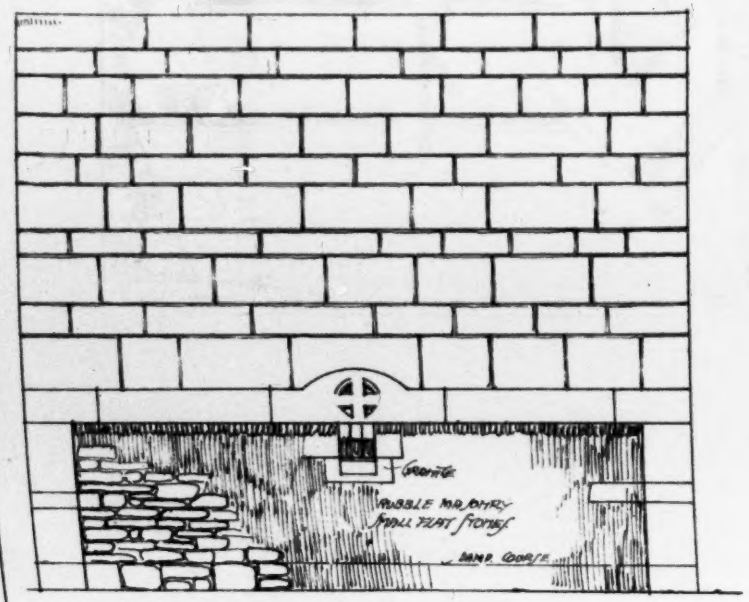
0 1 2 3 4 5 10 FEET



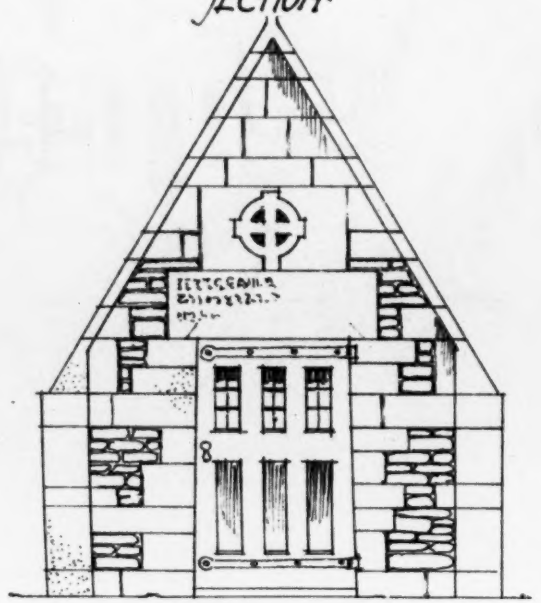
SECTION.



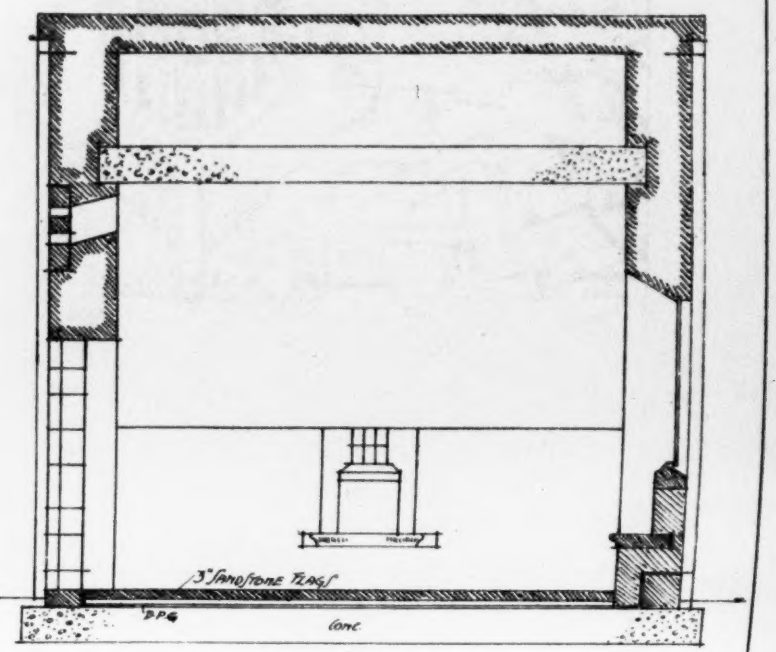
END ELEVATION.



SIDE ELEVATION



FRONT ELEVATION

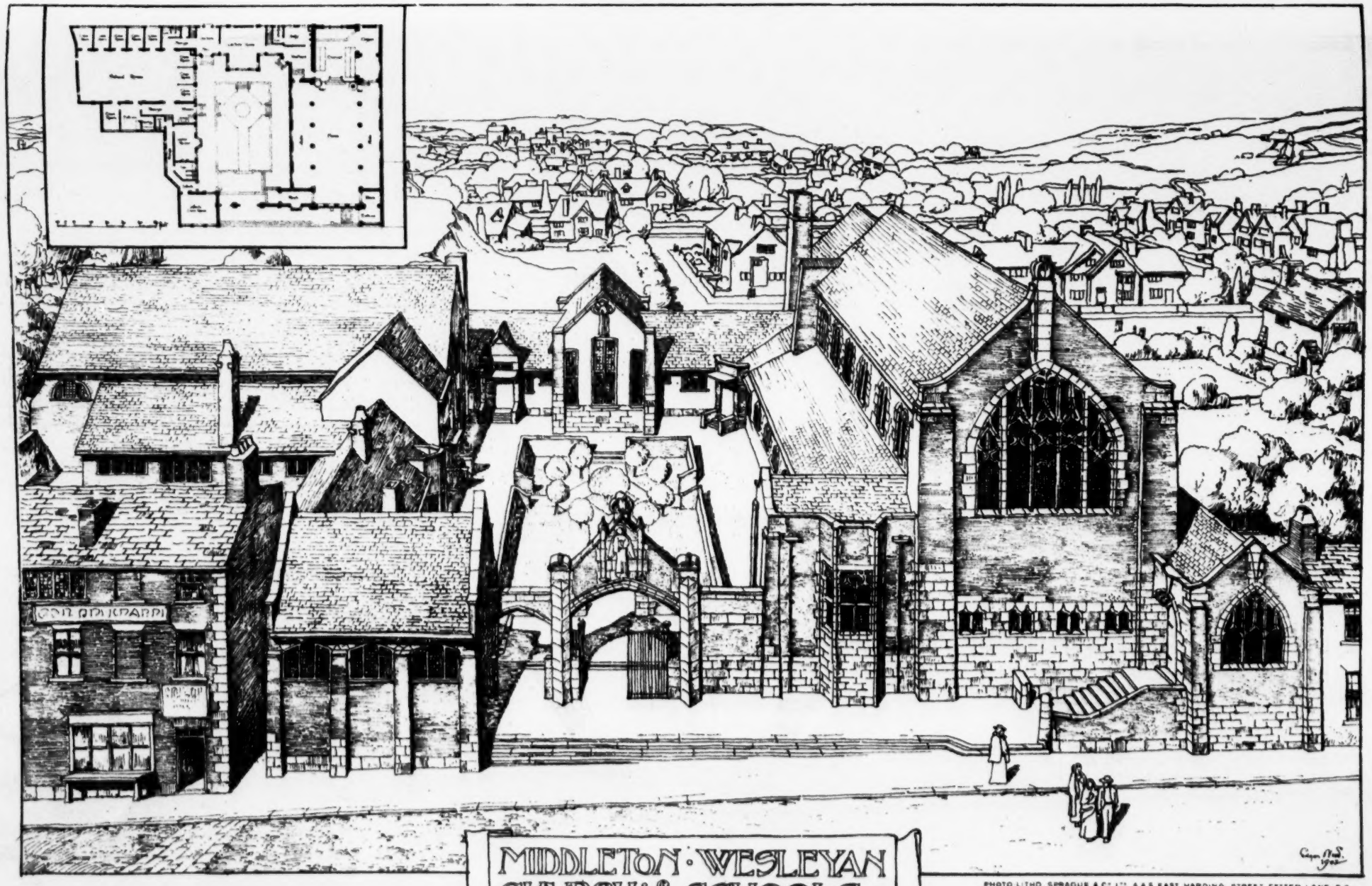


LONG. SECTION.

SIDE ELEVATION

FRONT ELEVATION

LONG. SECTION



MIDDLETON · WESLEYAN CHURCH & SCHOOLS

EDGAR · WOOD & ARCHITECT MANCHESTER

PHOTO LITHO. SPRAGUE & Co. Ltd. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE O'GROWNEY MEMORIAL TOMB, MAYNOOTH.

THIS is a rather unusual kind of memorial tomb, designed with a stern simplicity based on the suggestions of ancient Irish architecture. Everything about it has been made as solid and as imperishable as possible; concrete foundations, granite quoins at the angles, and a massive door of teak. In the upper part of this door are small lights made of bottle glass set in small bronze frames. The door is hinged also on bronze hinges.

Simple as the work is, it is the result of thought and an effort to produce something essentially monumental in character. The architect is Mr. W. A. Scott, of Drumcondra (Dublin), whose interesting church at Spiddal we illustrated a few weeks ago.

WESLEYAN CHAPEL AND SCHOOLS, MIDDLETON.

THE materials used in these buildings are common brick and warm-coloured stone with broken colour from the Runcorn district; the roofs are covered with stone slates. Many of the school buildings facing the quadrangle are finished in cement and whitened. The walls of the chapel inside are finished with common brick. The chapel and school have open timbered pine roofs.

The heating and ventilation are divided into two systems of the same type, the warm air being drawn in by the cold air being drawn out by the action of the heating of the air in the two ventilating shafts.

The seating accommodation of the chapel is for some 600 persons, with fixed pews and chairs.

The cost was 9,500*l.* for the total; the original site was very uneven, and a large portion had to be excavated to the extent of some 17 ft. in depth.

The principal contractors were Messrs. Nichol & Son, of Rochdale. The architect is Mr. Edgar Wood, of Manchester.

Books.

The Timbers of Commerce and Their Identification. By HERBERT STONE, F.L.S., F.R.C.I. London: W. Rider and Son, Ltd.

THIS is an excellent and useful book, though with some serious blemishes. Its object is to describe those properties of the timbers of commerce by which they may be most readily identified and distinguished one from another, and many of those properties, such as colour, smell, taste, degree of hardness, etc., are, of course, extremely difficult to describe on paper, especially since they are often liable to wide variation in woods of the same species. Of padouk, for instance, we are told that its colour is "rich red or crimson streaked with black" and "that its smell is little if any"; but, in the present writer's experience, the colour is often brown, whilst the smell, at all events of the red variety when freshly cut, is strongly aromatic. According to its degree of hardness, each wood is assigned to one of eight grades, of which ebony is placed in the first, oak in the sixth, and pine in the eighth; and here again, so far as English oak is concerned, we should very much doubt whether its hardness, as compared with that of ebony on the one hand and pine on the other, is placed high enough up the scale. Dry weight or density is easily ascertained and recorded, but liable to such variations in woods of the same species, and even in different parts of the same tree, that it is of little value for the purpose of identification. Roughly speaking, the higher the latitude in which a given species is found, the harder and heavier its wood is likely to be; whilst, as Goethe observed to Eckerman, wood on the north side of a tree is generally harder and heavier than that on the south, and was more highly valued for many purposes on that account by those old-fashioned craftsmen who loved to make their work as perfect as possible in all respects.

The means of identification mainly relied upon by the author of this book is, however, the anatomical character of the wood as studied through a microscope or pocket lens in the cross-section; and the work accordingly is admirably illustrated throughout by a series of photo-micrographs of these sections, carefully prepared for the purpose by Mr. Arthur Deane. So extremely diverse in character are these beautiful, and necessarily faithful, figures, which will themselves bear further magnification through the pocket lens, that here at last, we are inclined to suppose, is an infallible method for the identification of all known woods; but here again in many cases we are destined to disappointment. In the first place, 179 figures have to serve for 247 species of wood—one figure, for example, for four species of oak—so that it would seem to be admitted that identification by this method is only possible up to a certain point. Now, as a matter of fact, the most business-like attempt yet made at the classification of woods—the key to the more important exogenous woods of North America, published by the U.S. Department of Agriculture*—also bases its distinctions mainly on the magnified cross-section, and clearly distinguishes the American red from the American white oak by this method, the distinction in the size and number of the pores alone being easily visible to the naked eye. It seems, therefore, somewhat remarkable that the same figure should have been used to illustrate three American, as well as the European, species of this most important tree. We take Mr. Stone's word for it that there is only one European species of oak, but the European varieties at all events are so diverse in value and character that here again greater elaboration of treatment would have been very desirable. Both British and Continental subvarieties of *Quercus pedunculata* and *Q. sessiliflora* are treated under a single heading, the only means given of distinguishing between the former and latter variety being that which concerns their barks. Now, as regards the former or "white oak," the English wood is so much heavier, harder, and "stronger" than the imported kinds, so much more difficult to use, and so much superior on account of its greater durability and finer surface, that, whereas the large majority of furniture manufacturers who aim first at rapid and cheap production will have nothing to do with it, modern craftsmen who consider the quality rather than the price of their work are seldom content with the Continental substitutes. A distinction between the two kinds, therefore, is clearly possible, and it would have been interesting to have had it defined by so scientific an observer as Mr. Stone. Whether the same distinction obtains between the British and European varieties of the brown oak we do not know, never having seen a specimen of the latter variety; but both in England and on the Continent *Q. pedunculata* and *Q. sessiliflora* are generally distinguished very sharply, not only in the attachment of their acorns, but by reason of the colour of their wood, the vulgar appellations "white" and "brown" being found in most European languages. In England, at all events, this difference of colour is often very pronounced; that of *Q. pedunculata* when freshly cut being of a brown so pale as to be literally almost white, whilst that of *Q. sessiliflora* is a deep rich brown, sometimes approaching coffee colour. This difference of colour, however, is quite unnoticed by Mr. Stone. Perhaps he inclines to the theory that the rich brown colour is not characteristic of the so-called brown oak, but occurs, perhaps in either variety, merely as the result of incipient decay, or of growth in some peculiar soil. Yet on this question again the opinion of an expert would have been most desirable.

If the oaks are insufficiently treated by Mr. Stone, the mahoganies are a class of wood by which he is frankly puzzled. He comes to the conclusion that very few of our commercial mahoganies are the wood of the true mahogany, *Swietenia mahogoni*, but that they are mostly cedars and cedrellas. The grand commercial distinction between "Spanish" and "Honduras" he seems barely to recognise; and, on comparing sections of these easily-distinguished woods through a pocket lens with the figures given in this volume of *Swietenia*, *Caoba*, and *Cedrela*, the present writer is also unable to come to any useful conclusion. At all events, the distinction between the cold, hard, heavy "Spanish" wood, with its plainly visible white pores, and the lighter and softer baywood is a very real one, and will serve for all practical purposes until the difficulties raised in this volume can be cleared up.

Although Mr. Stone's main object is avowedly to provide a key for the identification of timbers, he also devotes a paragraph in his description of each species to its actual or possible uses; and perhaps this part of his work leaves more to be desired than any other. It was not, of course, to be expected, in describing such a number of species, that he should go into those details of breaking strain, etc., which Laslett attempted to supply; but if, as appears from the insertion of these paragraphs, he wishes to advise the intending purchaser with regard to the selection as well as the identification of woods, he often omits information which might have been easily given, and which is essential to that purpose. He tells us, for instance, that one wood is inclined to warp and shrink in a great, another in a less degree; but this very important information is frequently omitted even in the case of woods in the most general use, such as oak and mahogany. We ought surely to have been told that the last-named is perhaps of all woods the least liable to give trouble, and oak one of the most dangerous, in this respect; we ought to have been told, what many joiners and timber merchants are often grossly ignorant of, that all woods are much less liable to warp or shrink in radial than in tangential section; so that the method of cutting oak on the quarter instead of plank-wise is even more valuable for the constructive than for the decorative advantage which is so obtained. This point needs strongly insisting on. A further reason for the practice of quartering, which the present writer has never yet seen stated, is that oak, and probably other woods, planes up at least three times more easily when the rays are parallel than when they are perpendicular to the surface planed. The old carpenters understood these advantages so well that their oak panels were usually cut with wedge-shaped sections radiating from the centre of a good butt; but the practice even of quartering is now almost entirely discarded by English timber merchants. In conversation with one of them upon this question the writer was told that one reason against the practice of quartering is that oak so cut might be mistaken for Continental wainscot; the mournful inference being that if a tree is cut up in the right way it was not cut up in England!

It appears thus that, except for tyros and amateurs, this volume has little useful information with respect to the better known classes of wood; but, as the author observes in his preface, the most experienced man will sometimes come across timber with which he is unacquainted, and then, no doubt, he would find here useful clues to its identification. The book, moreover, should be possessed by all those who are interested in the subject, if only as a stimulus to further inquiry; and no more fascinating study than that of the various species of timber could well be undertaken by anyone with spare time and in need of a hobby. The great difficulty of studying imported or even native woods in the timber-yard arises from the fact that the leaves, flowers, fruit, etc., are seldom available; and it is by these, after all, that the species must be finally determined and classified. What is wanted next is a work illustrated with magnified cross-sections side by side with their appropriate foliage; but for this we shall probably have many years to wait, and, meanwhile, Mr. Stone's volume will certainly be regarded as a standard work on the subject he has so courageously tackled.

* Bulletin No. 10, U.S. Department of Agriculture, Division of Forestry.

A History of English Furniture. By PERCY MACQUOID. Vol. I., Parts I. and II. London: Lawrence and Bullen. 1904. 7s. 6d.

THIS sumptuous work is to be issued in about twenty monthly parts. The first part of the first volume contains an interesting preface indicating the divisions and subdivisions of the work. The main divisions are four. The first period to be dealt with is from 1500 to 1660, which the author calls the "Age of Oak," showing the evolution of the Renaissance from Gothic; the second dates from 1660 to 1720, when decided English characteristics are first evident; this period of the Restoration and Dutch influence Mr. Macquoid calls the "Age of Walnut"; the third period, 1720 to 1770, the "Age of Mahogany," is much affected by contemporary French work. The years from 1770 to 1820 will be entitled the "Composite Age," the age of the classical revival and see-saw taste, the forerunner of the unprincipled and unbalanced phase from which we are but now emerging.

It comes rather as a shock to be told that

nearly all the early furniture was, until the peace after the wars of Lancashire and York, made abroad; and again, that the craftsman was influenced entirely by architecture, and, "being unimaginative, borrowed all required detail from either structure, metal work, or textiles; these being all designed, if not actually carried out, by foreigners." No doubt, while the crafts were in the hands of the Church, the principal movers were the clever brothers who travelled from one country to another, learning and instructing; but that does not imply that little interesting furniture was made in this country before 1480, when a cabinet-makers' guild is first heard of.

It is a great pity that there are so few remains of XIVth century work; yet we think Mr. Macquoid might have given us a chapter on work previous to 1500, even in an account of English furniture.

The subdivisions of the "Age of Oak" are three —"Gothic," "Elizabethan," and "Jacobean." For the Gothic period, as already indicated, there are but few examples on which to express an opinion; for the beds and chairs, for instance, we are almost entirely dependent on illustrated histories, romances, and books of Hours. A collection of reproductions of these would be a valuable addition to the literature of this subject. Chapter I. deals with this Gothic period, giving an excellent and most interesting account of the furnishing and disposition of a Gothic house. After drawing attention to the almost universal use of surface colour decoration, rich valances and hangings, and bright and costly cushions, which make us long for illustrations, this chapter describes several fine examples of furniture. The illustrations of these are mostly from photographs, exceedingly well done and reproduced. There are also three coloured plates by Miss Shirley Slocombe. The illustrations show some fine old livery cupboards, with pierced door panels for ventilation, forming a most effective decoration; credence-tables and chests of this period are also given, bringing us to the later period of linen-fold or parchment panels of Flemish origin. The dossier and canopied seat, which was placed on the dais at the head of the room, is only illustrated by the nearest remaining approach to it, *i.e.*, choir-stalls. Mr. Macquoid attributes their complete disappearance to the fact that they were usually fixed pieces of furniture built into the wall of the room.

Chapter II. deals with credence-tables and cupboards. The descriptions of their use is no less interesting than their design. Both these pieces of furniture are evolved from the early chest. Very interesting, too, are the author's remarks on the colour of the oak and its treatment. Varnish was not used in this country until the middle of the XVIth century; Gothic and early Renaissance furniture was neither wax-polished nor oiled, but left untouched. So-called black oak is the result of deep-toned varnish. The latter half of this chapter deals with the beginnings of Italian influence, which becomes markedly apparent in the illustrations. Chapter III. promises to deal with chairs.

The second part, Vol. I., of this sumptuous publication is a continuation of the "oak period." Several fine early chairs are illustrated, as well as some beautiful stools, showing still lingering enchantment of Gothic fancy; these make all the more regrettable the absence of earlier work. With the XVIth century Italian ideas and Italian workmanship pervades everything. A description is given of inn accommodation in the middle of the XVIth century, besides many domestic details of interest, such as bedding, testers, valances, cushions and embroideries, as well as curious manuscripts giving insight to the manners of our forefathers of this period. XVIth century furniture shows architectural detail encroaching where it should not. One chest illustrated in the present work represents the elevation of a classic façade; cabinets and chests are naturally more subject to this form of abuse than the less square forms of furniture. Some of the most satisfactory work of the period is the leather-covered chests, bound with brass, and studded in handsome patterns with brass-headed nails; age has lent to these a richness and softness of colour that cannot be easily surpassed.

A considerable portion of this part is devoted to the grand old bedsteads of the Oak period. "Our ancestors considered the price of furniture connected with their birth, marriage, and death as most important, and emphasised this by a corresponding expenditure of money over it." These bedsteads and their accompanying furniture are especially mentioned in the wills of the nobility and gentry of the period. The illustrations of these are particularly well chosen; indeed, a feature of this book is the subjects illustrated, nearly all being from private collections not accessible to the public. The Part concludes with tables of this period. The fine oak trestle table at Penshurst is shown. It measures 27 ft. long, by 3 ft. wide, and the top has no joint in its length. The Duke of Devonshire's superb walnut table, inlaid with marqueterie, is also illustrated. We read that tables with plain tops, when not in use for meals, were often covered with a fine Persian rug.

How to Collect Old Furniture. By FREDERICK LITCHFIELD. (London: George Bell & Sons. 1904.)

THIS book is not a history of furniture; there is occasional valuable historic information, but its object is to give elementary and practical advice to amateur collectors of old furniture. It opens with the XVIth century, and gives a concise description of the Renaissance, showing the effect of architectural evolution on furniture. The chest, table, chair, livery cupboards, etc., are briefly described and their origins pointed out. Chapter II. deals with Jacobean furniture, a period of considerable interest, beginning as it does under the refining influence of Inigo Jones, who reduced the exuberant fancy of late Elizabethan design to an agreeable severity. The XVIIth century saw the wider introduction of upholstered furniture and much greater richness in English furniture, generally owing to its importation from Holland and France. The chapter on Dutch furniture shows how considerable was the influence of Holland, not only by importing direct, but also by the arrival of King William and Queen Mary, who brought many Dutch families to England in their train. The settlement of the Huguenots was also an influence upon the industrial arts of considerable importance. Thus outside influences make it a matter of no slight difficulty to distinguish English from foreign made furniture, and no doubt much of the so-called English furniture of the XVIIth century is Dutch. The architectural influence is marked during this century; the tradition of both architecture and the crafts was on established lines, and the result is very thorough workmanship and reasonable design.

The chapter on the XVIIIth century is the most interesting. With the Georges we come to a period of makers known by name. The chapter contains much of interest regarding Gillow, Chippendale, and their less-known contemporaries; Heppelwhite, the Adam brothers, and Sheraton. The "drawinge" table was not, however, invented by Gillow, who may have patented it, but the idea dates back to Jacobean times. This chapter ends with an account of the painted furniture of the period, and has something to say about polishing.

French furniture played so great a part in the design of all furniture of the early XIXth century that the chapter on the earlier French periods is quite necessary to a knowledge of the subject; we commend this chapter as particularly concise and to the point. It describes the different periods known under the Louis and the methods of the well-known makers, such as Boulle, Martin, and Gouthière, concluding with the Napoleonic period. The XIXth century shows the influence of this last period and the general introduction of Greek and Roman details. One chapter deals with "faked" furniture of various kinds, and another with valuable hints and cautions to the buyer, and the book concludes with an interesting glossary and an account of modern dealers' methods in buying and selling. All together the volume is a good handbook to possess on this subject.

Studies in Astronomy. By J. ELLARD GORE, F.R.A.S., etc. London: Chatto & Windus. 1904.

WE have several times referred to the articles on astronomical subjects by Mr. J. Ellard Gore, which have appeared from time to time in the *Gentleman's Magazine*. The book before us consists of these and some other articles which have appeared in *Knowledge* and *The Observatory*, collected and revised, partly rewritten and the information brought up to date.

This is an eminently sensible popular book on astronomy; we say "popular," because it is written for general readers and not for astronomers; but there is nothing "popular" in its style in the wrong sense of the word—none of the sensational paragraphs about the wonders of the heavens by which some writers about astronomy play to the gallery; it is a book intended to give solid and reliable information in plain language, and will be attractive to readers who want information rather than to those who only turn over books for amusement.

Among the subjects treated in separate chapters are "The Size of the Solar System"; "Jupiter and its System" (at present a subject of special interest); "The Distances of the Stars"; "The Sun's Journey through Space"; "The Suns of Space"; "The Darkness behind the Stars"; "The Nebular Hypothesis"; "Light, Electricity and the Ether," etc., etc.

In the chapter on the nebular hypothesis, and in fact in general throughout the book, the author's aim appears to be not so much to put forward any theories of his own, as to give the reader an account of the prevailing and most accepted theories, and the reasons for them. A great deal of the calculation and reasoning on which such theories are built can only be appreciated in detail by those who have had their minds trained in the higher branches of mathematics; by others they must be taken on trust. In this little book the author occupies the useful position of interpreter between the astronomical *savant* and the general reader.

Why, on page 4, does the author, in explaining parallax, say that "the solar parallax is the angle subtended at the sun by the earth's semi-diameter"? Why the *semi*-diameter? We should have supposed that the most accurate parallax for the sun would be got by taking the largest base possible, viz., the earth's diameter, not the half of that: unless there is some reason in the technics of astronomy for stating it in terms of the semi-diameter.

Municipal Shortcomings. A series of articles contributed to the *Liverpool Journal of Commerce*. By T. MYDDELTON SHALLCROSS. London: Elliot Stock. 1904.

THE twenty-five articles, which are reprinted in this pamphlet, have special reference to the city of Liverpool, and although the City Council cannot fairly be held responsible on all the counts of the author's indictment, the articles are well worth consideration. They are written in a popular style, free from technicalities—a method which has its advantages in an appeal to the man-in-the-street, but is not altogether convincing to those who have an intimate knowledge of municipal work. The author's theme is "The unnecessary unhealthiness of Liverpool," and the means whereby the death-rate may be reduced. There can be no doubt that the mortality is greater than it need be, and the author has done a civic service in drawing attention to the fact.

BOOKS RECEIVED.

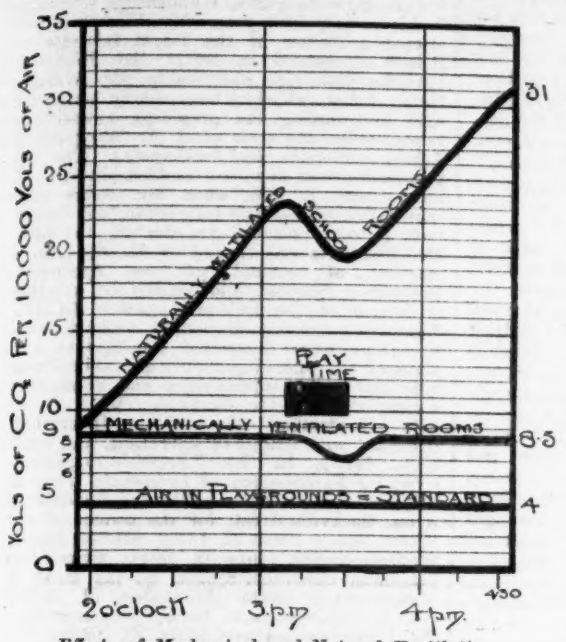
CITY DEVELOPMENT: A STUDY OF PARKS, GARDENS, AND CULTURE-INSTITUTES. By Patrick Geddes. (Geddes & Co., Edinburgh and London.)

CHINESE ART. By Stephen W. Bushell, C.M.G., etc. Vol. I. (Published by the Board of Education.)

LADY MARGARET HALL, OXFORD.—The Warden and Governors make an appeal for contributions to a sum of 13,000*l.* which is required for the completion of the block containing the dining-hall and library, and of the north wing for residential rooms—known as the Wordsworth Buildings. The hall was founded at Norham-gardens, Park Town, in 1879, as a ladies' college, somewhat analogous to the older colleges of the University. The hall receives fifty-two students. The additional buildings for the chapel, library, and gymnasium were planned and designed by Mr. Basil Champneys. In our issue of February 13, 1897, we published an illustration of the south wing of the Wordsworth Buildings, of which the middle block and the north wing were not then erected, situated beyond Norham-gardens, on the road to the Cherwell. The south wing contains twenty-eight students' rooms, common-room, lavatory and bathrooms. The north wing is also intended for the students. The middle block will contain the main entrance hall and staircase and the dining-hall, with the kitchen and offices below and the library above.

TRADE CATALOGUES.

We have received a pamphlet of forty-eight pages entitled "Healthful Schools: What Engineering Can Do." The author is D. M. Nesbit, of the firm of Ashwell & Nisbet (Leicester), and the pamphlet contains an account of the method of mechanical ventilation adopted in certain schools in Bradford, Leicester, and elsewhere, and of the results obtained. The author does not enter into details of design and mechanism, but writes in a general way for the purpose of bringing the subject of mechanical ventilation before the notice of all interested in education. Incidentally he draws attention to the ridiculous pamphlet in praise of "natural ventilation" published anonymously a year ago in the style of a blue-book, and also quotes from the discussion at the R.I.B.A. in June, 1904, and from other sources of information. The pamphlet is not an ordinary trade catalogue, but falls rather into this class than into that of "Books." The illustrations include the accompanying diagram of the state of air in schoolrooms in the same building under mechanical and under what is called "natural" ventilation; a practical document which we commend to the notice of our readers.



Effects of Mechanical and Natural Ventilation.

The Mork Patent Pulley Block Co. send us a circular describing their screw pulley blocks with quick return gear, the essential features of which have been mentioned in a previous issue of the *Builder*. They also enclose a leaflet giving particulars of Mork's scaffold chain, consisting of a lock plate and two chains. The plate is made of Siemens-Martin steel, and is so shaped as to cling tightly to the upright pole when the cross pole is suspended, and the greater the weight the firmer becomes the grip of the plate on the upright pole. The chains, being made weldless and of steel wire, are far stronger than ropes, especially when the latter have been exposed to all sorts of weather. This scaffold appliance is extremely simple, and should be a boon to builders and contractors.

We have received from Messrs. Drake & Gorham, of Victoria-street, Westminster, a book entitled "Light and Power," describing many of the arrangements for the electric light which this firm have installed in country mansions. Numerous photographs are reproduced, many of which will be instructive to youthful electricians, and a few are of general interest. Useful hints are given on such subjects as "producer gas plant," oil engines, water turbines, etc. We can recommend this work to anyone interested in installing electric light in a large mansion, as the arrangements of the lights in dining-rooms, picture galleries, etc., shown are instructive, and the power-house illustrations show clearly the magnitude of the plant and the space required for installations of various sizes.

We have received from the Stanley Electric Manufacturing Company, of Pittsfield, U.S.A., a large wall map of California showing clearly the routes of the high-pressure lines which are being used for the transmission of power by electricity. The longest transmission line at present is 232 miles, and the most important one is from Electra to San Francisco, a distance of 147 miles. The mean daily load on this latter line is 10,000 horse-power. The Stanley Company are experts in the transmission of power over great distances, and one of their engineers, Dr. Perrine, has written the standard work on the subject. Stranded aluminium cables are now the type of cable most commonly employed for this class of work. In some cases very long spans of wire are employed. In mountainous districts spans of 1,800 ft. are sometimes made, and have apparently given very little trouble. The pressures employed vary from 40,000 to 60,000 volts.

M'Tear & Co. (Belfast) have sent us a tiny booklet containing descriptions and prices of the felts manufactured by them for roofs, sarking, damp courses, etc. Full instructions are given for fixing, and also for preserving the various felts. Mention is also made of the bow-and-string girder or truss constructed of wood for light roofs.

The Coalbrookdale Company have sent us two sheets containing illustrations, descriptions, and prices of their patent "Speedon" radiators. The general principle of the invention is not altogether new, as gas has for some time been used for heating independent radiators containing hot water. The "Speedon" radiators are heated either by gas or by electricity, each radiator being, according to the description, "a complete hot-water circulating system within itself." The radiators will no doubt prove useful, the principal advantage being that the water retains the heat for some time after the gas or electricity has been switched off.

"The Ideal Fitter," an illustrated catalogue, price list, and reference book, has been sent us by the American Radiator Company. It is a new edition, and contains some new features. The contents include illustrations and full details and prices of boilers and radiators of different types for heating apparatus, valves and other accessories, air-gratings, tools, etc. Twenty pages are occupied by useful tables and suggestions on piping and other details of heating apparatus. The catalogue is convenient in shape and size, and clearly printed.

Messrs. Graham, Morton, & Co. (Leeds) have sent us a copy of their interesting catalogue, No. 940, which contains a large number of illustrations of their own works and of conveying plant of various kinds erected by them at home and abroad. The illustrations are the principal feature of the catalogue, the descriptions of the apparatus being of the briefest, and no prices being given. Among the apparatus we notice belt and bucket conveyors for unloading, conveying, and elevating coal, coke, hot ashes, slag, etc.; some of the appliances are decidedly ingenious, and all are devised for the purpose of reducing manual labour and of expediting the conveyance of materials.

From Mr. W. E. Farrer (Birmingham) we have received a copy of a catalogue containing complete illustrations and descriptions of his "improved automatic distributor" for distributing sewage over the surface of small bacteria-beds. The invention consists of a galvanised-iron tipper, which receives the effluent from the septic tank and (when full) discharges it automatically into a series of perforated channels laid on the surface of the filter. The tipper may be either single or double. The latter is arranged so that it discharges the sewage alternately to the right and left, thus bringing two filters into use alternately. For small sewage-purification works, such as those for country houses, the apparatus is well worth a trial. The catalogue contains information which will be of use to those contemplating the erection of such works.

"Hobbies" of Dereham (Norfolk) have sent us their catalogue for 1905, containing illustrations and prices of tools for amateurs, fretwood of various kinds, and some hundreds of fretwork designs for articles of more or less supposed utility.

We have received from Mr. W. Höfler a catalogue divided into six sections; the first contains photographic illustrations of oak panelling and other joinery, and the second deals with "art metalwork" of various kinds, including grilles, signs, lamps, and door-furniture. The remaining sections are shorter, and comprise hand-painted tiles, the patent asphalted sheet-lead dampcourse, wall-papers, etc. Many of the designs for oak panelling and metalwork are excellent, and the catalogue as a whole will prove useful as a work of reference for architects and others. The asphalted lead dampcourse has been extensively used abroad, and, as the illustrations show, it is adapted for roofs, tanks, etc., as well as for walls.

Messrs. Chavasse & Kerr (Birmingham) send us their catalogue containing illustrations of various forms of the "Tropican" patent fire-grate, which gained the Coal Smoke Abatement Society's certificate rather more than a year ago. The grate is simple, the body consisting of corrugated fireclay slabs, and the ironwork being reduced so that it does not appreciably obstruct the heat. There are no front bars. According to the certificate mentioned above, this grate was one of five tested by the Society, and "showed the best results in the diminution of smoke, the heating power of the grate, and the economy of fuel." Any grate which ensures more thorough combustion of fuel than is possible in the ordinary grate, is worthy of a fair trial, and we have no doubt that this will be given to the "Tropican." The illustrations in the catalogue are far from satisfactory, and will not do much towards pushing the sale of the grate.

The new catalogue issued by Messrs. S. W. Francis & Co. contains illustrations of their various kinds of wood, iron, and steel revolving shutters, brass and other metalwork for shop-fronts, plate-glass and other fascias and stall-plates, iron gates, etc. The testimonials printed in the catalogue range from 1857 to 1901, and the firm is so well known that it is unnecessary for us to describe their manufactures in detail.

The London Warming and Ventilating Co. have sent us their catalogue of firegrates, ranges, etc. It is divided into a number of sections, dealing respectively with plain and tiled register stoves and hob-grates, interiors, mantel registers and iron mantels, wood mantels, dog-grates and curbs, stoves, gas fires, anthracite stoves and grates, and the patent "Record" kitchen ranges. Perhaps the most interesting open grate is the "Florence," designed for burning anthracite coal. The catalogue is well printed and fully illustrated and priced. Many of the designs are inartistic and old-fashioned, but this is what everyone expects in a trade catalogue; good, bad, and indifferent types are collected so that every taste may be pleased.

We have received from Messrs. Doulton & Co. a large and elaborate catalogue of sanitary fittings. The illustrations consist almost exclusively of half-tone blocks carefully prepared from photographs or wash drawings, and printed on smooth paper. Ten illustrations of fitted bath-rooms are first given, and then follows the first section on water-closets, which occupies eighty-four pages. Obsolete closets, such as the wash-out, are not included, but various forms of wash-down and siphonic closet are shown, together with two or three valve-closets; trough-closets and ranges of wash-down closets with automatic flush-tanks are also illustrated. The section on baths runs to 106 pages, and contains an excellent assortment of cast-iron and earthenware baths, shower and spray baths, towel-airers, and other fittings. The next section on lavatories is of almost equal length, and contains illustrations and prices of lavatories of nearly every type, including four views of the lavatories and sinks fitted in the operating rooms of various hospitals. The urinal section (forty-two pages) is also an interesting record of the company's most recent improvements, the first place being given to a series of circular-backed stall urinals in glazed fireclay. In the sink section (forty-two pages) there are illustrations of wash-up sinks of various kinds, slop-sinks, mortuary slabs, etc. The volume concludes with a short section on cast-iron manhole-covers, gratings, soil and drain-pipes, flush-tanks, etc. The catalogue is a valuable work of reference for the architect and builder, who will find in it fittings suitable for buildings of every class.

Mr. John Jones sends us his new catalogue ("Section List A") of cast-iron drainage

fittings, pipes, etc., among which we may mention intercepting and other traps, and a great variety of airtight cast-iron inspection-chambers, cast-iron channel-bends and junctions or manholes, drain-pipe bends and junctions, gullies and rainwater-shoes, soil-pipes and manhole-covers. The catalogue contains a comprehensive assortment of the fittings required in connexion with iron drains, and is well illustrated and fully priced.

"Firegrates, Mantels, and Accessories" is the title of a catalogue received from Messrs. Barnard, Bishop, & Barnards. It is divided into two sections, the first dealing with firegrates, mantels, curbs, etc., and the second with kitchen ranges, heating apparatus boilers and radiators, etc. An interesting feature of Section I. is the preliminary series of plans and sections of the seven different types of "fire-basket" made by the firm, the "Victoria" being without iron bars, and the "Economic" having all the angles of the back and bottom well rounded and a very small ash-grate along the front part of the bottom. Many of the numerous designs for interiors, and for cast-iron and wood mantels are simple and artistic. Section 2 is of a more practical nature and contains illustrations of kitcheners, hot-water boilers of various types (including examples of sectional boilers), radiators, etc. The catalogue contains altogether about 160 pages, and is well-bound, clearly illustrated, and fully priced.

Messrs. Wood & Andrews (Manchester) have sent us a copy of the large and interesting catalogue issued by the Metallic Roofing Co. of Canada. It shows the uses to which sheet metal, painted or galvanised, is now put in Canada, and, as far as we know, cannot be matched by the catalogue of any firm in this country. Here, when galvanised iron roofing is required, the old stock corrugated pattern is adopted without a thought that any other design is possible. In Canada there is no such dearth of invention, or fear of innovation. While there is much in the Metallic Roofing Co.'s catalogue to condemn, from an artistic point of view, such as the stamped metal sheets in imitation of rock-faced masonry and the like, there is also very much to praise. It is fully illustrated, the descriptions are complete, details have been thoroughly considered, and the builder will have no difficulty in carrying out the instructions given for fixing the various goods. Among the contents we may mention sheet metal of various designs for roofs and walls, fire-resisting doors, stamped metal mouldings, enrichments and sheets for walls, ceilings, coves, etc. "Hayes" metal lathing, and even pressed metal dressings for windows, dormers, etc. The fire-resisting doors are made in a number of stock patterns, and are very ingenious; they are of wood, in three thicknesses, covered with fireproof paper, and entirely sheathed with sheet metal. Each side of the door is sheathed with a single sheet of metal, which is stamped into panels to fit the wood backing, the edges of the metal being turned back to cover the edges of the woodwork. The catalogue, which runs to more than 350 pages, contains illustrations of many Canadian buildings in which the company's manufactures have been used.

Messrs. Adamsez, Ltd. (Scotswood-on-Tyne) send us a four-page list containing illustrations, descriptions, and prices of their patent pneumatic closet-sets, in which the cistern is operated by a jet of air entering the bell of the siphon. The air is transmitted from a small bellows, which is actuated by means of a press-button or by seat-action. The device is ingenious, the only moving mechanism being the bellows.

Messrs. G. Kalms & Co. (Brixton) send us a sheet descriptive of their apparatus for drying damp rooms in new buildings. The apparatus contains a chamber in which the air is heated, and thence circulated through the room.

Mr. William Cooper has sent us a sheet containing illustrations and prices of portable houses, studios, and other buildings constructed of wood and galvanised iron. The buildings are of ordinary type; according to the description, "ornamental finish to gables and pinnacles is studied from the most approved Gothic designs," but unfortunately this ornamental finish does not give to the buildings any architectural merit. No fireplaces or chimneys are shown in any of the designs, nor are they mentioned in the descriptions.

Mr. F. Wallis Stoddart's pamphlet "On the best method of sewage disposal for small communities" is not a trade catalogue of the ordinary type, but rather a dissertation on the subject of sewage disposal in general, with particular reference to the author's patent sewage distributor. This has been described in our columns more than once, and we need only repeat that it was designed for the purpose of distributing sewage uniformly in drops over the surface of percolating filters. The pamphlet contains illustrations and descriptions, not only of the distributor, but also of the other portions of the purification works, including the tank, filter, etc. It is ably written, and well worth the consideration of architects, surveyors, and engineers.

We have received from "Aspinall's Enamel"—this being the name of the company—a little book containing specimens of their "decorators'" enamels and "wapicti" washable distempers. There is a good range of colours in each class, and the book will be useful to the architect as well as to the decorator.

From the Brilliant Sign Co. we have received an illustrated catalogue and price list of their manufactures, which include letters of all kinds and sizes in wood, copper, brass, aluminium, glass, etc. The catalogue also shows glazed stall-plates, signs, and fascias in considerable variety.

Mr. George Wragge (Salford) sends as a four-page circular containing illustrations and prices of his "in and out casement for safety cleaning," and of a small casement ventilator for fixing in one of the squares of lead-light glazing. The former is the more important invention, and is simply a wrought-iron casement pivoted at the top and bottom about 4 in. from one side; thus, in a casement 18 in. wide the pivots will be 14 in. from one stile and 4 in. from the other. The larger portion opens outward, and the outside can easily be cleaned when the casement is open, by passing the hand and duster through the 4-in. space. In the case of a three-light window an "in and out" casement in the central light allows two fixed side lights to be cleaned. The sections of the metal used in the casement are somewhat intricate, and we judge from them that the casement will be thoroughly watertight.

Messrs. J. Constantine and Son (Manchester) have sent us a descriptive pamphlet in praise of their convoluted stove for supplying fresh warm air to Turkish baths, houses, and public buildings. The stove has been on the market for the last forty or fifty years, and has recently been used for several important Turkish baths, etc., but the makers are doing themselves a disservice by issuing a pamphlet so badly written and containing expressions so extremely biassed and unwarranted. In the preface the authors fall foul of those "warming and ventilating engineers . . . who have strange, dogmatic opinions of some one scheme of ventilation which they are ever ready to apply to any building for whatever purpose it is to be used, to some of which it is entirely wrong and must fail." We commend this curious sentence to the authors' notice, asking them to substitute "warming by convoluted stoves" for the word "ventilation."

From the Edison and Swan United Electric Light Company we have received a catalogue (Section II.) containing illustrations and prices of a variety of electric light fittings and accessories suitable for ships, factories, and mines. The fittings are of simple character, without unnecessary ornament, and are fully illustrated and priced.

Messrs. Lockerbie & Wilkinson have sent us a copy of their catalogue, "G," of rainwater pipes, heads and gutters, soil pipes, ornamental ironwork, etc. The catalogue is admirably got up, and the contents are extremely interesting. Many of the rainwater heads (which are cast in either lead or iron) are of an artistic character, and special attention has also been given to the design of the sockets and ears of rainwater pipes—with excellent results. The "Duecless" patent fixing is an ingenious contrivance for fixing pipes to stand 1½ in. clear of the brickwork. The lead soil pipes and rainwater pipes are also worth mention, plain and ornamental pipes and tacks being shown. All these goods and also the rainwater gutters are fully priced. The remaining contents of the catalogue are of a more general character, and are introduced for the purpose of drawing attention to some of the other departments of the firm's work.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS AND GRAVERS.—The President and Council of the International Society of Sculptors, Painters and Gravers will hold a reception on the evening of Saturday, January 7, at the New Gallery, Regent-street.

OBITUARY.

MR. WIMPERIS.—We regret to announce the death, on December 21, at No. 37, Half Moon-street, of Mr. John Thomas Wimperis, formerly of No. 25, Sackville-street, Piccadilly, and Bolingbroke-grove, Wandsworth Common, in his seventy-fifth year. Mr. Wimperis was elected a Fellow of the Royal Institute of British Architects in 1877. In February, 1889, he took into partnership Mr. William Henry Arber, who had been closely associated with him during the preceding twenty-four years, under the style of J. T. Wimperis & Arber, architects and surveyors. The co-partnership was dissolved as from June, 1897, on January 1, 1898, when Mr. Arber purchased Mr. Wimperis's interest in, and undertook to carry on the practice of, the firm. Mr. Wimperis was elected in March, 1902, a member of council of the Architects' Benevolent Society, and retired by rotation in March of the following year. Of Mr. Wimperis's more important architectural works we have illustrated the designs and plans of the following buildings:—The Granville Hall, with supper-room and annexe, as a completion of the Granville Hotel, Ramsgate (September 12, 1874); Invercauld, Braemar, with extensive alterations and additions, 1870-5, in the "Scottish baronial" style, for Farquharson of Invercauld (June 5, 1875; view, and lower hall); the Sunderland Arms, Sackville-street, for the owners of the Sutton Estate (June 19, 1875); Hatton House, Westgate-on-Sea (June 12, 1886); Duke-street Mansions, Grosvenor-square, on the Duke of Westminster's estate (November 12, 1887); No. 11, Charles-street, Berkeley-square, after the Palladian manner (July 18, 1891); No. 16, Soho-square, for Messrs. Orme & Son (October 31, 1896); Hill House, Hampstead, with alterations and enlargement, for Mr. George Fisher (August 27, 1898, garden front); reconstruction of No. 35, Dover-street, Piccadilly, for the Empress Club, on behalf of the Hotel, Club, and Investment Company (September 2, 1899); and designs for the Oriental treatment of the subway connecting two of Messrs. Liberty's premises in Regent-street (May 16, 1903); the subway was subquently constructed, but with a different treatment. Mr. Wimperis, or the firm, during the period we mention above, prepared the plans and designs for No. 23, Berkeley-square, in 1890; the reparation of the interior and exterior of the parish church of St. James, Piccadilly, with a reinstatement of the roof, in 1884, and the new choir vestry in 1899; blocks of houses in Davies-street and South Molton-lane, in 1899-1900; the new Palace Music-hall and Theatre of Varieties, with Thomas's Great Western Hotel, Plymouth, 1899; the enlargement on the sites of Nos. 36, 37, and 38, Jermyn-street of Prince's Restaurant, Piccadilly, with the iron and glass shelter and new grill-room at the east end in Piccadilly, and the reception-rooms and alterations of the Art Gallery, 1898-1901; the new Palace Theatre, Blackburn, 1898-9; the alterations and the new library, with winter gardens, etc., Forest Lodge, Tulse Hill, for Mr. G. Adney Payne; the Hotel Osborne, Berkeley-street, Mayfair, begun in 1898; additional premises in Dover-street, W., for the Empress Club, opened in July, 1900; buildings on the south-west side of Park-walk, Chelsea, between Chapel-street and Winterton-place, with the widening of those two thoroughfares, for Mr. R. C. H. Sloane-Stanley, in 1898; new works, with alterations and improvements, at the London Pavilion Music-hall, 1899-1900; No. 50, Charles-street, Berkeley-square, for Mr. Mossop; alterations at the Canterbury Music-hall, Lambeth; and enlargement of the Athenæum, in Godolphin-road, Shepherd's Bush, in 1899-1900; business premises and dwelling-houses at Kingston-on-Thames, King's-road, Chelsea, and in many other parts of London, and the environs; No. 15, Berkeley-street, W., for the Hotel, Club, and Investment Company; rebuilding of No. 5, Stafford-street, Pimlico; and alterations of the upper portion of Willis's Restaurant, King-street, St. James's, for occupation by a club, 1902; a house in Gwendolen-avenue, Putney, one of his most recent works; and, in 1886, a mansion in Grosvenor-square. In July, 1886, Mr. Wimperis acted, in conjunction with Mr. D. Cubitt Nicholls, as professional adviser—in an honorary capacity—in respect of the limited competition for the St. James's Dwellings, in Carnaby-market, Regent-street, W.

MR. STELFOX.—We have also to announce the death, in his forty-ninth year, of Mr. Henry Ernest Stelfox, of No. 6, Princess-street (formerly of Clarendon-chambers, Mosley-street), Manchester, and of Windsor-road, Levenshulme. Mr. Stelfox was Ashpitel prizeman, 1888, and was elected an Associate of the Institute in that year, and subsequently

Fellow. He served his articles in the offices of Messrs. Baker & Ellis. He was the architect of many private houses, commercial buildings, banking premises, parish halls, and similar buildings in Manchester and the country around, and, during the last ten years or so, of several large schools. Amongst the last-named we may mention the schools in North Grecian-street, Broughton, to receive 590 infants and 500 girls on the two floors, with two assembly halls and a caretaker's house, at a cost of about 14,000*l.*; in Tootal-road, Weaste, with a central hall and seven classrooms for each of the three departments, and with provision for the teaching of cookery, laundry-work, and manual instruction, for 1,275 scholars, the designs being after the English Renaissance in character, and the total cost amounting to nearly 16,000*l.*; in West Peel-street, Regent-road; and in Devonshire-street, Higher Broughton, for about 800 scholars, for which his designs were selected in competition—all for the Salford School Board; the Board Schools in Ashton Old-road, for the Manchester School Board; the St. Peter's church schools, Swinton, to accommodate 1,000 children; and an equally large school for the Levenshulme Urban District Council. In the earlier part of his career Mr. Stelfox held a lectureship of the Manchester Society of Architects, of which he was a Fellow. We understand that arrangements will be made whereunder the completion of the architectural works upon which he was engaged at the time of his death is to be entrusted to Messrs. C. K. & T. C. Mayor, of Manchester, architects.

MR. W. G. LAWS.—We regret to announce the death of Mr. W. G. Laws, who for many years was City Engineer and Surveyor for Newcastle, and had latterly been consulting engineer. Deceased was born, sixty-two years ago, at Tynemouth, his father being agent to the Duke of Northumberland. Mr. Laws served his apprenticeship with Messrs. Thompson & Boyd, engineers, Newcastle, and afterwards, having adopted the profession of civil engineer, he was much engaged upon the work of the North British and North Eastern Railway Companies. He designed, among other works, the bridge at Wylam. Mr. Laws was appointed Borough Engineer of Newcastle on December 7, 1881. He had been in private practice in Newcastle; but it was stipulated that, when appointed, he should devote his whole time to the duties of Borough Engineer. Mr. Laws retired from the more active duties of his office in November, 1901, when Mr. F. J. Edge was appointed to succeed him. Mr. Laws was then appointed consulting engineer. He was a past-president of the Association of Municipal and County Engineers, a member of the Institution of Civil Engineers, and a member of the Institution of Mechanical Engineers.

MEMORIAL BUST, WESTMINSTER.—A marble bust of the late Mr. William Ewart, M.P., was recently unveiled in the reading-room of the Westminster Public Library. It is the work of Mr. George J. Frampton, R.A.

SWEDISH TIMBER TRADE IN 1904.—In a memorandum dealing with the economic situation in Sweden, Mr. F. S. Clarke, Secretary of H.M. Legation at Stockholm, observes, *inter alia*, that a great change for the worse has this year taken place in the export of timber. The results of 1903 were good in the provinces, and prices, in spite of a fall, ruled high. Sawn and planed wood was last year in great demand for South Africa—over 80,000 standards having been exported there, but the supply seems to have been greater than the demand (which was of a speculative nature), and the South African market, as regards such goods, has consequently been closed to Sweden during the whole of the present year. Prices in the United Kingdom (which usually buys 40 per cent. of the total) and in France for Swedish timber fell, and considerable insecurity prevailed in the export trade. This insecurity and the fall in prices has been increased by "obstinate resistance" on the part of many of the Swedish exporters, and by cheap sales at Archangel and at other Russian and Finnish ports. The price of planks fell some 25 to 30 per cent., while battens fell about 10 to 15 per cent. Scantlings and wood of smaller sizes fetched about the same prices as before. The decrease in comparison with last year in exportation up to the end of July last in planed and sawn wood was about 69,500 standards. Taking, as average values for wood of all kinds, the figures given by the Board of Trade in the Export Statistics for 1902, it is seen that the figures in the first six months of 1904 show a decrease of from eight to nine million kroners (440,000*l.* to 500,000*l.*)—a sum which may even be put higher if the fall of prices is taken into account.

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES (*concluded*).

THE three kinds of pitch—all of the same origin—given in Table III. were investigated by E. Donath and M. Asriel, and a notable residue of organic matter was left insoluble. This, also, was examined, and the results are given below:—

TABLE IV.—RELATION OF ORIGINAL COMPOSITION TO RESIDUE.

—	—	Carbon.	Hydrogen.	Nitrogen.	Sulphur.	Oxygen.	Ash.	Insoluble Residue per cent.	Anthracine in Petro. Spirit Extract.
Coal-tar pitch soft	As set forth in Table III. (Section 2).	91·89	4·62	—	—	0·78	—	22·82	trace.
„ „ medium		94·32	3·98	0·148	0·77	to	—	38·06	„
„ „ hard		93·16	4·36	—	—	3·5	—	29·39	2·19
Black powder residue after the three extractions		89·2	2·3	0·7	—	7·13	0·67	—	—

In the large percentage and nature of the organic matter left from coal-tar pitch, there is thus possible a clear differentiation from refined Trinidad pitch or natural asphalt, but that factor is not sufficient as between the last-named and the petroleum pitches used for many artificial asphalts.

To find out more of the nature of the several bituminous combinations, Dr. Lunge and V. Krepelka (*vide Chemiker Zeitung*, 1904) tested nine different varieties of natural asphalt, four artificial asphalts prepared from petroleum pitches, and a hard and soft coal-tar pitch, by treating them with commercially pure chloroform. The extractions dried at 120° C., were then examined for specific gravity, melting point, and for absorption of iodine. In addition, the specific gravity of a solution of given strength of the several bitumens in chloroform was tested, but found to be incapable of materially assisting the discrimination. The melting point of rock asphalt or of artificial asphalt is affected by the proportion of base to bitumen and other organic matter, but the melting points recorded in the next table are those of the extracted bitumens in each case, and show that the quantity of extract must be supplemented by a knowledge of its properties. The melting point of the crude soft and hard pitches (coal-tar) were 97° and 235° F. respectively, whilst their extracts were 68° and 73° F. respectively.

The melting points were determined by Kraemer & Sarnow's method, to be hereinafter described, and in each the mean of four tests is given.

The iodine value, determined by Hubl's method, is for the purpose of ascertaining the way in which the carbon compounds constituting the bitumens extracted are built up.

To show the relation of the melting points of the extracted bitumen, as given in Table V., to the bitumens as they occur in the gross, see table at foot of this page:—

Table V. shows that the natural rocks vary in their properties (as exemplified by the sub-groups), but within certain limits that are in accord with practical experience, and that the departure from these properties is greatest in the coal-tar pitches where with an almost equivalent melting point there is nearly a threefold iodine value and a 25 per cent. increase in the specific gravity of the bitumen. With the petroleum pitch there is not much disparity in the iodine value or specific gravity of the bitumen, but more in the melting point. The difficulty of determining the amount of the adulteration of natural asphalt with petroleum pitch up to 20 or 25 per cent. is so great that Kovacs declares it to be impossible, but its presence

TABLE V.—TESTS OF EXTRACTED BITUMENS (LUNGE AND KREPELKA).

Class.	Origin and Description of Substance Tested.	Melting Point of Bitumen Extracted by Chloroform. Deg. Fahr.	Iodine Absorption.	Specific Gravity of Bitumen at 17° C. = 62·6° Fahr.
Natural Asphalts.	Limmer, near Hanover	60·8	23·37	0·9877
	Lobsann, in Alsace	77·0	23·84	1·0343
	Average of sub-group	68·9	23·60	1·0110
	Val de Travers, Swiss Canton of Neuenberg	82·58	26·53	1·0823
	Tataros, Hungary	92·48	39·71	1·0931
	Bermudez, Venezuela	124·00	46·28	1·0861
	Seyssel, nr. Bellgarde-on-the Rhone, France	127·6	44·33	1·0762
	Trinidad (not known what part)	131·36	54·10	1·0994
	Average of sub-group	111·6	42·19	1·0874
	Selenico	194·0	46·99	1·1131
	Gilsonite, Utah, U.S.A.	253·4	46·68	1·1495
	Average of sub-group	223·7	46·835	1·1313
	Average of nine natural asphalts	127·04	39·09	1·0802
Artificial asphalts. Petroleum pitches.	Galician	64·76	44·79	1·0365
	Unknown	100·04	44·26	1·1075
	Beaumont, in Texas	156·74	46·97	1·1741
	Wietze	244·76	52·02	1·1269
	Average of Petroleum Asphalts	141·68	47·01	1·1112
	Coal-tar pitch soft	68·0	69·34	1·2365
	„ „ „ hard	73·4	64·39	1·2741
	Average of Coal-tar Pitches	70·7	61·86	1·2553

Substance Tested.	Melting Point.	Percentage of Total Bitumens.	Percentage of Bitumen as Petrolene.	Authority.
Coal-tar pitch soft	97° F.	Not given.	Not given.	Dr. G. Lunge.
Coal-tar pitch hard	235° F.	Not given.	Not given.	Dr. G. Lunge.
Venezuelan pitch	150° F.	96·1	69·1	Laboratory, Imperial Institute.
Trinidad pitch or asphalt	192° F. to 428° F.	35·2 to 61·5	44·0 to 75·3	Laboratory, Imperial Institute.
Trinidad manjak	327° F.	95·25	12·6	Laboratory, Imperial Institute.
Barbados manjak		Nearly 100·0	Probably over 20.	Laboratory, Imperial Institute.

qualitatively can be proved by chemical tests, which he sets forth in the *Chem. Rev. Fett und Harz Industrie*, vol. 7. He there gives particulars for preparing solutions of the bituminous extract, and all the substances he tested gave precipitates from these solutions, on the addition of absolute alcohol; that from the coal tar being brown, the bitumens black, sticky, and pitch-like, the petroleum pitch

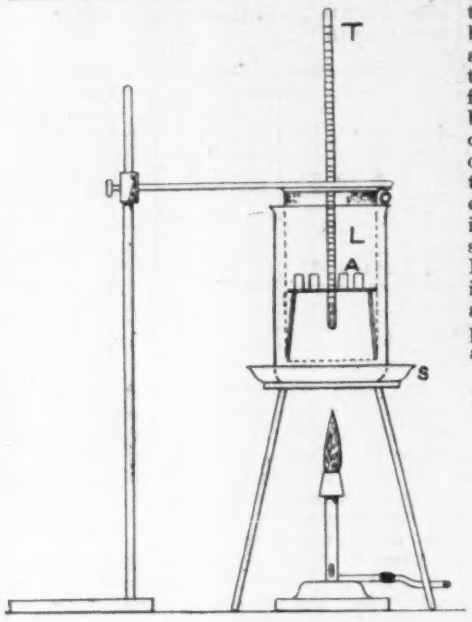


FIG I.

and an unknown suspected substance, a fine, flocculent, black deposit. On drying these precipitates at 90 to 95° C., that from coal tar was pulverulent and light brown, from the bitumen black, sticky, and of high lustre, drawing out into fine threads when warm; whilst the other two were black, dull, earthy, and crumbled readily between the fingers. On agitating with absolute alcohol some of the original solution, the coal-tar pitch furnished a brown precipitate and a black, pitchy deposit; the petroleum pitch and the unknown sample, a black, muddy precipitate; and the natural bitumens, black precipitates or pitchy, cohesive deposits.

His conclusions are to the effect that the sticky cohesive properties of the ultimate constituents, as just described, account for the superiority of the natural asphalts for paving materials, as compared with petroleum pitch, which largely consists of earthy matters cemented by empyreumatic resins and oils, and soon loses its properties under the influence of sun and frost.

Continuing his researches, M. J. Kovacs has devised a plan of testing the viscosity or "dropping temperature" of asphalts, a description of which apparatus will be given later. He finds that asphalts for foot pavements must not "drop" under 176° Fahr., and for roadways not under 221° Fahr., and that it is useful to check the determinations by a standard bitumen kept for the purpose.

He advises that the term "asphalt" shall refer only to natural products, which occur either in the pure state or mixed with lime or sand, being, in the *pure state*, black and lustrous, and at the ordinary temperature tough and sticky or almost solid and brittle, with a dropping point not under 95° Fahr., easily and completely soluble in carbon bisulphide, turpentine, and chloroform, with difficulty soluble in petroleum spirit and benzene, and almost entirely insoluble in alcohol.

Specimens in their Normal Condition Tested for Viscosity by M. Kovacs.	Dropping Temperature in Degrees Fahrenheit.
Trinidad Asphalt	200·3
Dalmatian ,, (bituminous limestone)	206·6
Normal ,, ...	221·0
Tataros ,, (hard Hungarian bitumen)	237·2

These results may be compared with those in Table V. for the extracts, and those to be given later for artificial asphalts by Kraemer & Sarnow's method.

Recent investigations by Mr. Clifford Richardson have shown that an additional clue to petroleum pitch is to be found in the fact that "paraffin" is usually present, and that this can be detected and weighed by Holde's method, as modified by him. Natural asphalt he has found to be free from "paraffin," and the measure of the adulteration when mixed with a known percentage of a petroleum residue was found to be accurate. In this way a 20 per cent. admixture was detected with these particular substances. It must, however, be pointed out that all petroleums are not alike, and there is one great distinction between those of America and Russia, viz., that the former almost entirely consists of a series of bodies called "paraffins," whilst the last consists almost entirely of a series of bodies called "naphthenes." Richardson has shown that there is evidence pointing to the presence of naphthenes in the Trinidad asphalt oils, in this respect as in others the deposits being similar to those of Baku in South Russia. In Europe there are petroleums of composition intermediate between the American and Russian, a fact that must be borne in mind in the interpretation of "paraffin" percentages in artificial asphalts.

FIG II.

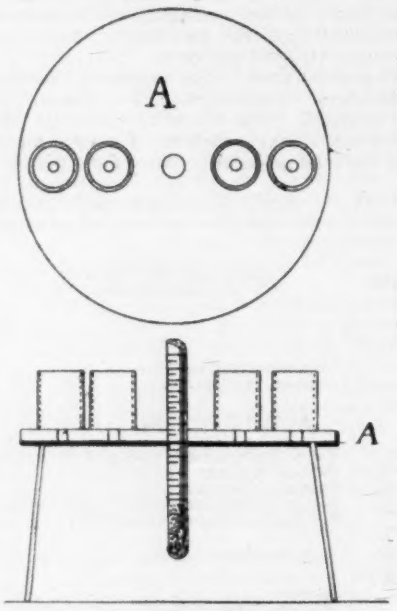


FIG III.

The condition of the various classes of material in Trinidad, point to the fact that exposure to air and consequent oxidation have a considerable influence in their formation from the liquid gulped forth in a constant stream mixed with water, from which escapes sulphuretted hydrogen. The presence of sulphur in the asphalt appears to have an influence upon the properties, which, however, has not yet been clearly ascertained, but the facts just mentioned have led to patents being taken out in Europe and America for conversion of petroleum residues, from oil distillation works and others of a like nature, by blowing air through the mass, and in some cases adding a percentage of sulphur. Whether added sulphur can take the place of sulphur incorporated in a natural product during its genesis, remains to be proved, but it is well known that it has a marked effect when mixed with indiarubber, a substance akin to the bitumens. It is impossible to go into further details as to the effect of oxygen and sulphur, but the facts are mentioned to show what class of material is likely to be met with on the market, and to direct attention to the appropriate methods of discrimination.

The Effect of Liquid and Gaseous Hydrocarbons.

It has been found in Frankfort, in Brooklyn, and other cities where asphalt paving is used that the surface becomes disintegrated and softened if petroleum from passing vehicles or axle boxes of the same is allowed to drop upon it, and, further, that the heavy hydrocarbons of coal gas have a similar effect. The continued leakage of gas under an asphalt roadway has been found to be injurious, and the affected portions of the substance when tested liberated gas. Passing similar gas into a tube containing sound asphalt speedily brought about the change, which ceased and was reconverted on exposure to air and absence of gas. Tests have showed that the constituents of the gas that were active were those that are absorbable by petroleum oils; an additional proof of the kinship of asphalts to petroleum.

Methods of Determining the Viscosity and the Effect of Heat upon Asphaltic Substances.

The effect of the "petrolene" is to facilitate the softening of the asphalt under the continued application of heat of a moderately high temperature, apparently causing a flux of those constituents that have a higher melting point. This is manifested in the creeping or buckling which is known to occur in hot weather with all except the best asphalts, and to determine this factor it is not sufficient to test the melting point as observed by raising the temperature over a short period of time only until liquefaction takes place, but to ascertain the viscosity by "dropping," or (what appears almost equivalent) the flux, by the effect of an ascertained temperature under a definite pressure. The first of these classes is that of M. Kovacs, whilst the second is that of Kraemer & Sarnow.

M. Kovacs' appliance is described at length in *Chem. Rev. Fett und Harz Industrie*, 1902, and is shown in the subjoined diagrams Figs. I., II., and III.

On a sand-bath S, about 6 in. diameter, with a ½-in. layer of sand is placed a beaker O, of 4 in. diameter and 6 in. high, containing sufficient rape-seed oil and glycerin to cover the beaker L, of 3½ in. diameter and 6 in. high, three-fourths of its height. In this air-bath the dropping frame (shown in Figs. II. and III. plan and vertical section) is placed. It consists of a brass disc, perforated in the centre for a thermometer, and with four perforations of

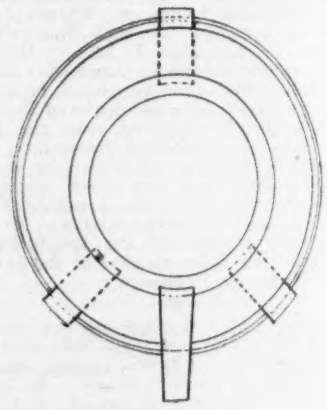


FIG IV.

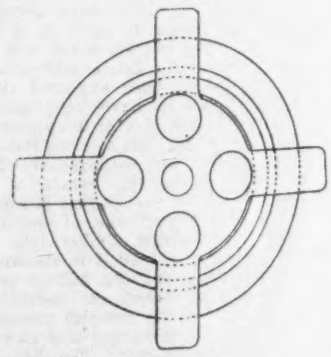


FIG V

2 mm. = ·08 in. diameter, around which a brass cylinder of ⅛ in. internal diameter and 1¼ in. high is soldered. The disc is supported by a tripod 2½ in. high. A regulated Bunsen burner is placed under the sand-bath, so that the temperature of the air-bath is evenly raised in each determination. The air-bath is covered

with a cork or glass plate. In testing hard-grade asphalts, 7·7 grains (½ grm.) is weighed out, formed into a pellet, and allowed to stand for from ten to twenty minutes. A pellet is then inserted in each of the small tubes of the dropping frame, this is immediately placed in the air-bath with a thermometer, and a thermometer is also suspended in the oil-bath. The gas burner is applied to the sand-bath, and after some time the softened asphalt is visible underneath the perforated disc, and as soon as it drops the temperature shown by the thermometer in the air-bath is noted. The following temperatures were observed in an experiment showing the rise per minute :—

At start	20° C.
After 5 minutes	22° C.
„ 10 „	32° C.
„ 15 „	48° C.
„ 20 „	65° C.
„ 25 „	81° C.
„ 30 „	95° C.
„ 35 „	106° C.
„ 40 „	114° C. = 237° Fahr.

The apparatus devised by G. Kraemer & C. Sarnow (*vide Chemische Industrie*, 1903) depends upon the flow of a definite head of mercury through a column of the bitumen substance and noting the temperature of this fluxing point, or melting point, as in Table No. V. It was brought out to overcome difficulties experienced with older methods in determining the softening point of coal-tar pitch, and has found general employment in the German tar industry.

The diagrams Nos. IV., V., VI. show the apparatus, which is quite easy to construct. Nos. V. and IV. are plans, whilst No. VI. is partly in elevation and partly in section. A quantity of about 25 grms. (386 grains) of the pitch under investigation is melted in a small beaker in an oil-bath (see Fig. VII.) at about 150° C., the pitch forming a layer about ½ in. thick. Into this is dipped an open-ended tube made of glass, 4 in. long and ¼ in. internal diameter. On removing the tube the upper end is closed

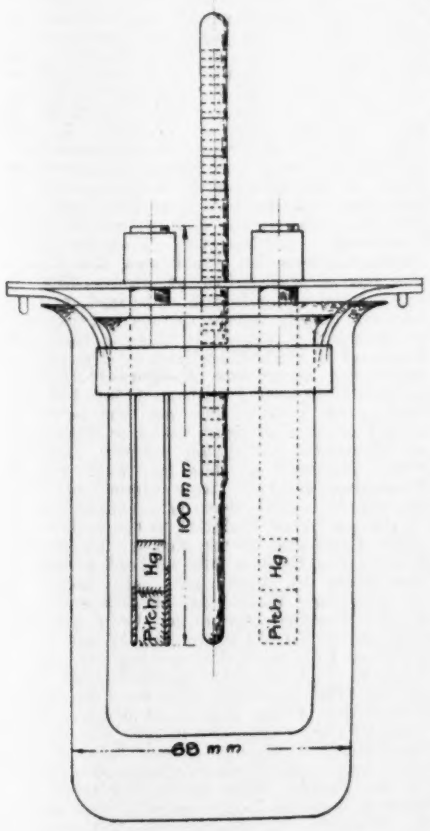


FIG VI.

by the finger, and the pitch is allowed to solidify in the tube whilst it is held horizontally and rotated. When the pitch has set, the portion adhering to the outside is removed, and the length of the column inside the tube will be about 2 in. On the top of this is poured 5 grms. (77 grains) of mercury. The tube containing the pitch and mercury is then suspended in a beaker full of water resting in another beaker also full of water. The inner beaker also contains a thermometer, the bulb of which stands at the same level as the pitch. The outer beaker is heated by a Bunsen gas flame of small size. The temperature shown by the thermometer in the inner beaker is noticed immediately the mercury falls through the layer of pitch and is recorded as the softening, fluxing, or melting point of the latter.

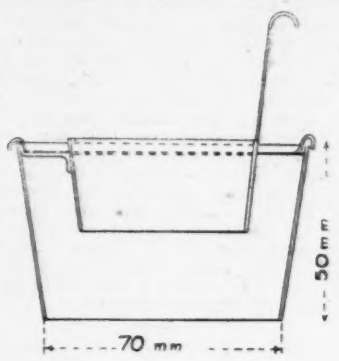


FIG VII.

As seen by the illustrations, several observations can be made at once. With substances which soften above 194° F., the outer beaker is filled with paraffin or paraffin oil and the inner with saturated brine or magnesium chloride solution. The thickness of the column of pitch does not within limits affect the result; a layer of pitch of 5, 6, and 7 mm. thickness having softened at 61·0°, 60·5°, and 61·5° C. respectively. The mercury is shown upon the pitch or asphalt being tested in the vertical section of the tube in Fig. VI., and is marked H_g.

Tests made by the apparatus gave the following results on pitches and asphalts of considerable variation in fluxing property; given in degrees Centigrade :—

Soft Pitch.	Medium Pitch.	Hard Pitch.
Average of four results on pitch from Grahms.		
51·375	68·55	80·325
Average of three results on pitch from Erkner.		
50·5	61·2	86·666

Refined Hard Asphalt.	Glass Hard Asphalt.	Petroleum Residue from Alsace.
52·0	82·0	105

GENERAL BUILDING NEWS.

ST. MARY'S CHURCH, NUNEATON.—The Abbey Church of St. Mary the Virgin, Nuneaton, has been long a ruin, a small and plain church having been built amid the ruins in 1876 for the use of the parish. Since 1876 the population of the parish has increased more than fourfold, and is now about 7,000, and in March last it was resolved to proceed with the restoration, keeping carefully to the original lines, and preserving all that remains of the ancient work. Mr. Harold Brakspear was appointed architect. The complete scheme includes rebuilding the chancel, the north and south transepts, the central tower, and a further portion of the nave. This will give a total accommodation of 900 seats. The cost will be over 14,000*l.*, but only 800*l.* is as yet subscribed or promised.

PROPOSED CHURCH, HARROGATE.—Work has just been commenced at Harrogate on a new church, which is to be erected on a site in Duchy-road, at an approximate cost of 24,000*l.*, excluding the completion of the tower and spire. Mr. Temple Moore, architect, has prepared the designs for the building, and Mr. Thomas Rawling, builder, York, has secured the first contract.

NEW CHANCEL AND CHAPEL, EASTBOURNE.—The newly-erected north chapel and chancel of St. John's Church, Meads, Eastbourne, were recently consecrated by the Bishop of Chichester. The additions have been carried out from the designs of Mr. A. R. G. Fenning, Meads, and are in flint faced with Bath stone in conformity with the original structure, the interior being lined with yellow bricks ornamented with red Sussex bricks, and faced with Bath stone. The organ chamber has been altered to fit the organ, which has been entirely rebuilt.

COUNCIL SCHOOLS, LEEDS.—The new Brownhill Council Schools, which have been erected by the Leeds Education Committee, were opened on the 22nd inst. The schools occupy a site in Harehills-lane, the area of the land being 8,663 sq. yds., and the total cost will come to about 21,210*l.* The buildings are in two blocks, the larger block facing to Harehills-lane, having been arranged for senior and junior mixed children. The larger block is two stories in height, and provides accommodation for 480 junior children on the ground floor, and 480 senior scholars on the first floor. The infants' school is a separate building, and is only one story high, accommodation being provided for 560 children. Three assembly halls are provided—one for each department—and classrooms are arranged round the halls. There are twenty-six classrooms in all. Two fireproof staircases are provided for the upper floor of the mixed department. One classroom is specially fitted up for cookery instruction. The buildings throughout are electrically lighted. There are also concreted playgrounds. The buildings have been designed under the direction of the architect, Mr. W. S. Braithwaite (Architect to the Education Committee), of Leeds.

A NEW MASONIC TEMPLE.—On Tuesday, St. John's Day, a Masonic temple, which has been erected at a cost of about 8,000*l.* in Cadzow-street, Hamilton, by the Kilwinning (No. 7) Lodge of Freemasons, was consecrated by Colonel P. Spence, Provincial Grand Substitute Master of the Province of the Middle Ward. The lodge dates back to the XVIIth century, and its written records commence in the year 1732, when the Duke of Hamilton of the time was building Chatelherhault. A couple of years ago they disposed of their original quarters to the town for street improvements. The new temple is situated in a prominent position, and has, on the ground floor, two suites of offices. The lodge-room is on the upper floor, entered through a large doorway in Cadzow-street, the lodge-room proper being a spacious apartment with all the necessary adjuncts. Facing Lower Auchingramont-street is a hall for letting purposes, which provides accommodation for 400 persons, along with a house for the caretaker, cooking kitchen, etc. The design, which was chosen by competition, is in the old Scots style of architecture, and is by Mr. Alexander Cullen, architect, Hamilton. In finishing the interior, special attention has been given to the colour decoration, and a free use has been made of stencil ornament. The entrance hall and staircase are painted in shades of purple and green, and the reception hall in white and lemon. The lower walls of the banqueting hall are of green, and the ceiling and frieze white, with stencil ornaments introduced at the frieze. The lodge-room has received special care. The vaulted roof is of a lemon colour, relieved by green and purple bands, and the intervening spaces decorated with Masonic emblems. Over the entrance are the signs of the Zodiac, while at the east end over the Master's chair is the rising sun. The furniture of the room has been designed by the architect. In the lodge-room are seven stained-glass windows, the three over the Master's chair having figure subjects, "Faith," "Hope," and "Charity," while the other four on the side walls show different degrees in Masonry. The preparation-room has three lights, representing "The Way," "The Truth," and "The Life," and the reception-room has four windows of an Eastern character. The rooms are lighted throughout with electric fittings.

MARKET HALL, SHEFFIELD.—The reconstruction of the front of the Norfolk Market Hall at Sheffield is now nearly completed. The frontage has a depth of 42 ft. The main entrance, which is 14 ft. 6 in. wide, is screened off from the Market Hall by folding doors. On either side of the principal entrance are lock-up shops, while on the first floor is to be a restaurant, and in the basement a *café*, both with entrances from Exchange-street. The new frontage is of stone and brick, the pilasters and columns being of polished Labrador granite. The architects were Messrs. Holmes & Watson, of Sheffield.

HOSPITAL EXTENSION, BRADFORD.—A new out-patients' department is to be built as an extension to the Bradford Children's Hospital. The new department is to be erected at the east end of the hospital grounds, quite detached from the main block, with frontages to Welbury-drive and Bertram-road. On the ground floor there will be a vestibule, a waiting-hall, capable of seating 150 to 200 persons, and an inner hall adjoining, having a registration-room, an operating-room, and a dispensary, all opening directly upon it. On the upper floor there is to be a house for the caretaker, who will act as lodgekeeper for the whole institution, and the basement will include a drug-store and heating chamber. It is estimated that the cost, including fittings and adaptation of the rooms at present in use for

out-patients, will amount to 1,700*l.* The building is to be constructed from plans which have been prepared by Mr. James Ledingham. The following are the contractors:—Excavators', masons', and bricklayers' work, Charles Booth & Son; carpenters' and joiners' work, Greenwood Brothers; plumbers' and glaziers' work, Gabriel Jackson; slaters' work, George Wilkinson; plasterers' work, Thomas Bolton; painters' work, James Lynn.

LIBRARY, WHITCHURCH, CARDIFF.—The new free library, built at Whitchurch by means of a grant of 2,000*l.* from Mr. Carnegie, was opened recently. The following are the dimensions of the building:—Ground floor—reading-room, 63 ft. by 27 ft.; lending department, 21 ft. by 16 ft.; librarian's room, 11 ft. 3 in. by 11 ft. 3 in. First floor—kitchen, and two bedrooms for caretaker. There are two entrances, one being reserved for ladies. The reading-room has been provided with a folding partition. There are fifteen newspaper stands and tables for magazines, with seating accommodation for sixty-four readers. The bookcases in the lending department will store about 6,000 volumes. The premises are heated by hot-water pipes. The elevation has been faced with Cattybrook red bricks, dressed with Bath stone. Messrs. R. & S. Williams, Cardiff, were the architects, and Mr. W. T. Morgan was the contractor.

CHELMSFORD FREE LIBRARY.—The foundation-stone of the public buildings at Chelmsford, which will comprise a free library and reading-room, science and art school, and museum, was laid recently by Lord Rayleigh. Messrs. F. Chancellor & Son, of Chelmsford and London, are the architects. The buildings comprise a ground and first and second floors. In the centre on the ground floor there will be an entrance hall, with main staircase, men's common-room, women's common-room, librarian's room, and office, with lavatory accommodation at the back. In the north wing on the ground floor there will be a museum, library, and large museum, and in the south wing the lending library and reading-room. The first floor will include a class-room for design, master's room, and casting-room, with store-rooms. In the north wing on the same floor there will be a life-room, a room for elementary art and mechanical drawing, and in the south wing a room for applied art, and this last will have a north light window. The apartments for the curator will be on the second floor. The buildings will be heated throughout with hot water, and lighted by electricity. The frontage to the Market-road is 82 ft. The exterior of the building will be faced with red brick, and stone dressings. The builders are Messrs. H. Potter & Son, of Chelmsford, and the clerk of the works is Mr. James Bugg.

LIBRARY, PLUMSTEAD.—A public library has just been opened by the Right Hon. John Morley, M.P., on the south side of High-street, Plumstead. The building has been erected from designs prepared by Mr. Frank Sumner, the Borough Surveyor and Engineer, by Messrs. Henry Lovatt & Co., of Wolverhampton, at a cost of about 14,000*l.* The building has a frontage of 60 ft., and a depth of 131 ft., and is entered from High-street by a vestibule, leading to a corridor. On the right is the newsroom, 56 ft. by 24 ft., furnished with stands for fifty-six newspapers, and two tables to accommodate fourteen readers. On the left is the magazine room, 29 ft. by 24 ft., with tables to accommodate forty-two readers. At the rear of the newsroom is the lending library, which, with the borrowers' space, covers an area of 62 ft. by 32 ft., and has at present accommodation for 20,000 volumnes. The total length of the lending counters is 59 ft. The ladies' room, with accommodation for twenty-eight readers, and the librarian's room are entered from the borrowers' space. The juvenile library, 34 ft. by 21 ft., has a separate entrance and vestibule from the private road on the east side of the building. It has sitting accommodation for forty-eight readers, and also contains the lending counter for the juvenile department. This portion of the building does not communicate, except privately, with other parts of the library. The first floor of the public portion of the building is approached from the end of the corridor by a stone staircase, and comprises a reference library, 65 ft. by 24 ft., and spare-room, 65 ft. by 30 ft. The reference library is lighted by three large ceiling lights, and has accommodation for 6,500 volumes. The spare-room has an elliptical ceiling, and has been designed with the object of being used as a museum, or for library lectures. In the basement are repairing and store rooms, with shelving available for 5,000 volumes. Lift communication with the lending and reference libraries is also provided. The residence for the librarian is situate on the first floor. The building is electrically lighted, this portion of the work being done by the Borough Electrical Engineer (Mr. J. B. Mitchell). The floors are fireproof. The elevation of the building in the High-street is faced with Fareham red bricks, having Portland stone dressings, while the east elevation is faced with Ibstock red bricks, and similar dressings.

TOWN HALL, MOUNTAIN ASH.—Lord Aberdare opened a new town hall at Mountain Ash recently. The building stands on the site of the old Workmen's Hall. On the ground floor are offices for the surveyor, sanitary inspector, overseers, and rate collectors, with a hall and staircase leading to the first floor. On the first floor is a council chamber and room for the town clerk and education department. On the top floor are several rooms for the use of the caretaker. The principal floors are fireproof, covered with wood blocks. Those used for the council chamber are of oak. The corridors and halls are laid in mosaic work, and the principal staircase in granolithic. These, together with the wood blocks, have been executed by Messrs. B. Ward & Co., Cardiff, and the blocks by Messrs. J. Smith & Sons, Derby. The contractors were Messrs. E. R. Evans & Brothers, Cardiff. The amount of the contract was 4,300*l.* The architect for the building was Mr. John H. Phillips, Cardiff.

STAINED GLASS AND DECORATION.

LEVEN, FIFE.—A three-light east window has just been fixed at this church by Messrs. Percy Bacon & Brothers, of London. The centre light contains three figures, the top depicting Our Lord in Majesty, with Moses and Elias in the two spaces under, while on each side in the outer lights are St. Peter and St. Paul; under the two latter are angels bearing scrolls with texts.

SANITARY AND ENGINEERING NEWS.

LIVERPOOL WATER SUPPLY.—The report for 1903 of the City Water Engineer (Mr. Joseph Parry) contains information as to the supply of water to Liverpool, Wallasey, etc., the quality of the water, the source of supply at Vyrnwy and Rivington, the outlay and income connected with the undertakings, etc. The year in question, according to observations made on Rivington watershed, was one of the wettest on record, there having been only three years which exceeded it in the past half century. The total volume of water delivered from the Corporation works during 1903, including statutory compensation waters to rivers in Lancashire and Montgomeryshire, was 17,515,037,000 gallons. The additional number of new houses and other new premises supplied with water in the Liverpool district during the year was 4,111, the net number, after withdrawals, etc., being 3,284. The total number of tenants on the rent-roll of the water account at the end of the year was 187,751. As to the quality of the water, Professor Boyce reported that purity was well maintained during the year. The capital expenditure on the Liverpool waterworks for the year was 5,517,099*l.* 12s. 9d., and the gross revenue on ordinary account, including Chorley, 319,395*l.* 1s. 11d. The new reservoir at Prescot, which was practically completed before the end of 1903, is described with the aid of photogravure views, illustrative of the screening-chamber and automatic valve at the outlet, and of the overflow and washout.

DRAINAGE PLANS.—In addition to those already reported in the *Builder*, the following Borough Councils have considered the letter from the London County Council submitting for an expression of opinion a proposal by the Royal Institute of British Architects for the amendment of the by-laws relating to the details insisted upon in plans of drainage work required to be deposited:—Bermondsey—While agreeing in the main with the Institute's proposal, the Council is of opinion that the power of requiring the detail plans under the by-laws should be retained, but that this power should only be exercised when the local authority considers it necessary. Poplar—The Council holds that plans in accordance with the by-laws are necessary, and that the suggested amendment should be opposed. Southwark—Acting upon a report of the Borough Surveyor, the Council are strongly opposed to any alteration being made in the existing by-laws. Shoreditch—The Council has adopted a report from the Borough Surveyor to the effect that the by-laws referred to have assisted the Works Committee in the past in dealing with plans for drainage work, and that it is in the interest of the public generally that the fullest information should be set out before such plans are approved.

SEWERAGE WORKS, BENWELL.—The sewerage scheme, initiated by the Benwell and Fenham Urban District Council, was formally opened on the 20th inst. The main sewer is three and a half miles long, and cost close on 20,000*l.* The contractors for the work were Messrs. E. & A. Storey, the engineer being Mr. Harry W. Taylor.

FOOTBRIDGE, COPLEY.—An iron footbridge, erected by the Halifax Corporation over the river Calder, at a cost—inclusive of land for the necessary approaches—of 800*l.*, was opened on the 17th inst. Messrs. Graham, Morton, & Co. supplied the ironwork, and the stonework was carried out by Messrs. Bower Brothers. The plans for the structure were drawn by Mr. J. Lord, the Borough Engineer.

FOREIGN.

FRANCE.—A monument to Gavarni was inaugurated a few days since. M. Henri Guillaume, the architect for the work, has utilised the basin of the old St. Georges Fountain, in the centre of which he has placed an octagonal granite pedestal which forms the base to a column carrying a marble bust of Gavarni. Humorous figures recalling his principal works are sculptured in bas-relief on the column, and bronze masks, disposed about the rim of the basin, pour water into it. The sculptural part of the work is by M. Denys Puech.——An exhibition of the works of M. Bartholomé, the sculptor of the "Monument aux Morts," has been opened at the Galerie Hélrard, Rue Royale.——An "Exposition Internationale de peinture et Sculpture" has been opened at the Georges Petit Gallery, and will remain open to the end of the month. Among the exhibitors are MM. Carrier-Belleuse, Harrisson, Legorst-Gérard, Rochegrosse, A. Smith, Bernstamm, Puech, and Théodore Rivière.——A competition has been opened at Nancy for the erection of a Hôtel for the offices of the Chamber of Commerce.——A French committee has been formed to raise a monument to Sainte-Beuve at Lausanne. It is to be carried out by a Swiss sculptor, M. Lugeon.——A competition is to be opened for the construction of a boulevard along the line of the shore at Hyères.——M. Albert Ballu has recently discovered, in the course of his excavations at Timgad, some interesting remains of a Roman building which is supposed to have been a public library.——The municipality of Nancy have opened a competition for the laying out of a public park, with gateways and an iron grille, in the new quarter called Mont Désert.——A sum of a million francs has also been voted for the improvement of the market at Nancy.——M. Tournaire has been commissioned as architect for the enlargement of the Palais de Justice at Paris. The new buildings will include a tower at the angle of the Boulevard de Palais and the Quai des Orfèvres, but lower and more massive than that at the opposite corner of the Boulevard.——M. Nestor Alans, member of the Société Centrale des Architectes, has died, at the age of seventy-five, at Montpellier. He was a pupil of Lebas and of Lazard, and contributed largely to the various improvements at Montpellier, especially those in the neighbourhood of Halle Castellane.——The death is announced, at the age of eighty-three, of the painter Giacomelli, celebrated for his illustrations of birds. He was the artist for almost all the standard works on birds, such as Michelet's "L'Oiseau," André Theuriet's "Nos Oiseaux," etc. His last work was the illustration of the "Merle Blanc" of Alfred de Musset.——The death is announced also of M. Denys Darcy, architect to the cathedral of Saint Denis and to the diocesan buildings of Rheims and Evreux. He received a medal in the Salon of 1869, and gold medals in the Universal Exhibitions of 1878 and 1889.* ——M. Carolus Duran has been appointed Director of the Villa Medici. M. Duran was born at Lille in 1837; he was a pupil of Souchon, and received medals in the Salons of 1866, 1869, and 1870. He went through all the grades of the Legion of Honour, being named "Grand Officier" in 1900. He obtained the Medal of Honour in the Salon of 1879, and in the present year was elected a member of the Institut. The new appointment compels M. Carolus Duran to resign his position as President of the Société Nationale des Beaux-Arts (New Salon), but he has been specially requested to remain in office till the next Salon. When his resignation actually takes place, he will be succeeded by one of the four Vice-Presidents, MM. Roll, Besnard, Rodin, and Waltner.——The Académie des Beaux-Arts has elected M. Knauss, a German painter, Honorary and Corresponding member in the section of Painting.——M. Turin, architect, of Paris, has obtained the first prize in the competition for designs for

* The notes up to this point were postponed, for want of space, from a previous issue.

street booths (*baraques*) organised by the conductors of *Le Bâtiment*.——A new bridge is to be built over the Marne, between Champigny and Saint-Maur-les-Fossés.——A large casino is to be built at Nantes, to include a hotel, baths, theatre, and circus.——The "Société des Architectes de Seine-et-Oise" has elected M. Albert Petit, of Versailles, as President for 1905.——MM. Jasson, Gutton, and Lanternier have been commissioned as architects for a proposed municipal theatre at Nancy, to be erected at a cost of two million francs.——The ancient church of Villy-sur-Auxois (Côte d'or) has been classed among "Monuments Historiques."——It is proposed to build among the pine-forests of Arcachon, a "Lycée Climatique," conducted according to the most recent principles of hygiene.——The Conseil-Général of the Seine has opened a competition, for French painters, for the decoration of the new theatre of Fresnes; and M. Enders has been chosen, by the same body, to carry out the decoration of the theatre of Romainville.——A decorative picture by M. François Flameng, symbolising Music, has just been fixed in position in the Hôtel de Ville at Paris.——M. Nénot has been re-elected President of the Société Centrale des Architectes for 1905.——The Académie des Beaux-Arts has elected Mr. Stanhope Forbes an Honorary and Corresponding member, in place of the late Mr. Watts.——There is talk of erecting at Paris an "Opera Populaire" on a portion of the grounds of the old Marché du Temple. The auditorium will be planned in a fan shape, and capable of seating 4,000 persons. The building is to be entirely isolated, and carried out in incombustible materials, at an estimated cost of four million francs.——The Municipal Council of Paris has passed a vote to the effect that the old Hôtel de Rohan, which is of great artistic value, ought to be taken over and preserved by the State, after the removal of the Imprimerie Nationale by which it is at present occupied.——A new railway line is shortly to be opened between Paris, Bourges, and Montluçon, by way of Etampes, Pithiviers, Beaune-le-Roland, and Argent.——The jury in the competition for a new church at Coulommiers has awarded the first prize to M. Bruner, who will carry out the building.——The death is announced, at the age of sixty-seven, of the architect Arthur Froelicher, who carried out a number of private residences, more especially the châteaux of Muguet and of Rougellerie (Loiret), that of Rosendael at Dieppe, and numerous private hotels at Paris.——M. Detaille has been elected President of the Académie des Beaux-Arts, in place of the late M. Pascal. M. Jacquet, the engraver, is Vice-President.——The Académie has given, as the subject of the next Achille Leclère prize, "The Construction of a Belfry."——The work has been commenced for restoring and improving the Place du Trocadéro. The large central basin is to be replaced by a square in the centre of which is to be raised a statue of Beethoven, by M. Charmoy.——The death has been announced of M. Henri Schmit, architect of the Casino at Monte Carlo; also of M. Bouhon, Vice-President of the Société Nationale des Architectes.

GERMANY.—The new hospital at Munich, built by the architects Heilmann and Littmann, under the direction of Herr Stempel, was opened on November 8.——The new theatre at Stuttgart is not to be erected on the site of the old one, which was burned down; three sites are now under consideration. The building is to cost about 5,500,000 francs.——The manager of the theatre at Dessan has made a fireproof curtain which is said to combine the advantages of asbestos and iron, having the disadvantages of neither; the curtain is absolutely fireproof, having withstood a heat test of 1,500 deg.; old curtains can, it is stated, be remade in this manner.——A competition for designs for a town hall at Wilmersdorf, near Berlin, is to be held in April, 1905. The first premium offered is 8,000 marks, the second 5,000 marks, and there will be two third premiums of 3,000 marks each.——The synagogue at Düsseldorf, built from designs by Professor Josef Kleesattel, is completed; the building is intended to accommodate 1,300 people.——A new art gallery, called the "Heinemann" Gallery, has been built in Munich, after designs by Professor E. Seidl.——The Memorial Church at Speyer, designed by the architects, Flügge and Nordmann, is completed; the building cost nearly two million marks.——The architects, Reimer and Körte, are occupied with the designing of a building in Berlin for the Society of German Engineers.——The Commercial Schools at Cologne are to be built after plans by the architect, Herr E. Vetterlein, and will cost 3,100,000 francs.——The Church of St. Stephen, in Berlin, which was consecrated on December 4, is built in Early Gothic style from designs by the architect, Herr Bürckner.——A new hotel in "Pariser-Platz," Berlin, is being built from plans by Herr Gause; the building is to be in Italian Renaissance style.——The Town Council of Munich has offered premiums amounting to 12,000 marks for designs for exhibition buildings and grounds; the competition is to be open to all architects resident in Bavaria.——The new Law Courts at Hamburg are being built from plans by Messrs. Lundt & Kallmorgen.——The two new Catholic churches at Löwen have been built from plans by Herr Ludwig Schneider.

AUSTRIA.—The architect Herr Karl Dübell, director of the firm C. Bamberger, died at Vienna on November 15 in his fifty-ninth year.——The "Leo" Society will hold an exhibition of sacred art in the beginning of December in the Vienna Art Gallery.——The Austrian Museum at Vienna is being enlarged under the direction of Herr Baumann; the new buildings will consist chiefly of exhibition galleries, so that the older portions may be devoted to permanent collections.——Herr Arnold Heymann is the architect for a new theatre for Vienna, to be called the "Landstrasse" theatre.——A new theatre is to be built at Mähr to hold 800 people, at a cost of 400,000 kron.——The sculptor, Professor Edmund Hellmer, is executing a fountain in Hungarian marbles for the Vienna University; the artist has taken his idea from the legend of Castalia.——Herr Otto Kuhlmann has gained the first premium in the competition for designs for a Lutheran church at Chemnitz.

SWITZERLAND.—Herr Julius Stadler, the architect, died at Zurich on November 27, in his seventy-sixth year.——A Chemical Institute in connexion with the University is to be erected at Zurich, also new schools.——New technical schools are also to be built at Winterthur.——A new Almshouse is to be built at Einsiedeln, at a cost of 144,000 francs.——M. Edouard Guinaud is designing a series of workmen's cottages and gardens at Lausanne; each cottage is to be on a different plan.——In the competition for plans for schools at Vauseyon, near Neuchâtel, the following premiums have been awarded:—First premium (800 francs), MM. Prince & Bégiun, of Neuchâtel; second premium (600 francs), Herr Ubaldo Grassi, of Neuchâtel; third premium (300 francs), Herr Werner Lehman, of Berne.

DRAINAGE OF SANTIAGO.—A despatch from Mr. Lowther, C.B., H.M. Minister at Santiago, states that, in reply to an advertisement published in May last, only two tenders were submitted for the proposed drainage works at Santiago. One was by a Chilian contractor for the sum of 1,186,400*l*., and the other by a local firm, acting as agents for a French firm, for the sum of 1,350,000*l*. Mr. Lowther adds that both tenders have been referred to a commission for examination, but it is generally believed that fresh proposals will be asked for under modified conditions.

CEMENT IN ITALY.—Mr. Consul-General Chapman reports to the British Foreign Office from Florence, Italy:—"No British cement is now imported here; Italian cement is constantly used. The best quality comes from Bergamo, in Lombardy, but fairly good qualities are obtained in this district at Fabriano, Chiarvalle, Senigallia, etc."

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Rottmann & Co., wall-paper manufacturers, of Garlick-hill, Victoria-street, have opened new West-end showrooms at 29, Mortimer-street, W.——Mr. Arthur R. Mayston, architect, has removed his offices from No. 7 to No. 11, Great James-street, Bedford-row, W.C.——Messrs. A. Ransome & Co., manufacturers of wood-working and saw-mill machinery, will remove their London office on January 2 from their present address at Chelsea to 63, Queen Victoria-street, E.C.

SAVOY HOTEL, STRAND.—The associations of the site of the hotel with the earlier history of the palace and precincts of the Savoy are commemorated by a statue, designed and executed in gilded bronze by Mr. Lynn Jenkins, which has just been erected on the bridge at the entrance into the courtyard from the Strand. The figure, which is of the heroic size, clad in mail, with shield and lance, represents Peter, the uncle of Henry III.'s consort, Eleanor, whom the king created Earl of Richmond and Savoy, giving him the land by the riverside whereon the Earl built himself a palace in 1245. Peter gave his property there to the Prior and Brethren of Mountjoy (de Monte Jovis), near Havering-at-Bower, in Essex. The fraternity sold it to Queen Eleanor, who bestowed it upon her son, Edmund Crouchback, Earl of Lancaster, in 1284. The manor passed to Blanche, daughter and co-heir of Henry, Duke of Lancaster, who married John of Gaunt, and was then vested, as the Duchy of Lancaster, in the King and his successors on the throne. We observe that considerable pains have been taken to record, with inscribed bronze tablets affixed to various portions of the new structure, the positions of the older buildings which possessed no little interest from the historical and topographical points of view. That example might well be followed in similar cases; the tablets, besides being of value to the present generation, would often be the means of preventing perplexity and controversy hereafter.

BRITISH FIRE PREVENTION COMMITTEE.—No. 89 of the publications of the British Fire Prevention Committee contains nine tests of a lamp, for safety if overturned. The lamp is called the "Petrolite lamp," and is an apparatus in which the air is automatically and continuously carburetted by being made to pass in a downward direction through a receptacle charged with absorbent non-combustible material, saturated with light hydrocarbon (petroleum spirit), such receptacle being immediately below the burner, and the carburetted air being raised through a tube direct to the burner from the absorbent material by the heat of combustion in the chimney or funnel. The draught is started by applying a lighted match through an opening at the bottom of the chimney, or by inserting a lighted taper downwards in the chimney from the top, and the carburetted air thus drawn up will immediately ignite. The regulation of the lamp is carried out by the simple arrangement of turning one lever only, which simultaneously controls the air inlet to the carburetter, the carburetted air exists from the carburetter to the burner tube, and the air supply to the latter. The tests made, which, of course, were of a different character from those usually made on the Committee's premises, appear to have had very satisfactory results. The lamp was overturned several times in two of the tests, falling on the floor among shavings and other easily combustible materials, but in each case went out without igniting anything.

SURREY VAUDEVILLE THEATRE, BLACKFRIARS-ROAD.—Several improvements have been carried out, at a cost of about 6,000*l*., for the owner, Mr. de la Pole Temple-West, by Messrs. Kirk & Kirk, of Westminster. Mr. Temple-West has converted the old Surrey Theatre into a music-hall; all the pit floor has been relaid, two new stage boxes have been built, the stage is relaid with pitch-pine, and the grand circle tier is fitted with tip-up seats. The decoration scheme is in gold, cream, and light pink; electric light and hot-water radiators are installed. As the venture is of a somewhat novel kind, we may mention that the prices of admission range from 2d. in the gallery, which is one of the best in London, to 2s. for a chair in a private box. The theatre has belonged to the West family during more than a hundred years past, having been first built in 1782, as "The Royal Circus and Equestrian Philharmonic Academy," for Charles Dibdin and Charles Hughes, the circus-rider, in rivalry of Astley's Royal Amphitheatre in Lambeth. After a fire on August 11, 1805, the Royal Circus was rebuilt, from plans and designs by Cabanel the younger, as the Surrey Theatre, and the house has suffered greatly from fire on two occasions since.

AUSTRALIAN FORESTRY.—The importance of forest conservation is beginning to receive increased attention in the Commonwealth, where the revenue from the various State forest lands remains considerably below that obtained in countries possessing far less wealth of timber. In New South Wales the forests, contrary to the popular idea in Europe and America, extend over almost the whole area of the State, excepting portions of the Monaro, Lachlan, Murrumbidgee districts, and the trans-Darling region, where extensive treeless plains occur, clothed with salt-bush, scrub, or species of natural grasses. There are at the present time nearly six and a half million acres of forest reserves in the State. In South Australia there are nearly 200,000 acres of forest reserves and plantations; in Queensland, where forest conservation is of recent date, the reserved areas form a total of over 3,000,000 acres; in Victoria the forest reserves cover a total area of 4,679,540 acres out of 11,797,000 acres of forest country, the balance being mostly timber country difficult of access; in Western Australia a beginning has been made by establishing forest reserves, forming a total of over a million acres out of an estimated total of 20,000,000 acres; while in Tasmania about 33,300 acres have been reserved for timber planting and growing. The total area of forest land in the latter State is about 4,000,000 acres, and it has been estimated that

the forest lands of the Commonwealth cover an area of over 60,000,000 acres. The trees met with are chiefly species of eucalyptus, angophora, and other genera of the order Myrtaceae. The prevalence of the eucalypti, and the large extent covered by the forests, give the country a rather monotonous aspect: but the park-like appearance of the open forests, and the beauty of the many flowering shrubs, win admiration in spite of the sameness of the trees; while even the dull, greyish blue of the foliage of the gum trees, when relieved by the yellow blossoms of the wattle, including the graceful myall, or the beautiful and shapely kurrajong, is not without its attractiveness.

MATLOCK BATH IMPROVEMENT BILL.—The Urban District Council of Matlock Bath are promoting in the next session of Parliament a Bill dealing with a large number of matters relating to the improvement of the town. Amongst other matters they ask for powers to acquire lands and erect a pump-room for utilising the thermal waters of the Grotto spring, known as the Royal Well, and in connexion therewith to erect baths, pavilions, conservatories, waiting, refreshment, and reading rooms, and museum. They also seek to enlarge the recreation grounds, and improve the existing walks along the bank of the river Derwent, and to erect pavilions for concerts, etc., in the recreation grounds. The Bill also gives the District Council further powers with respect to the regulation of buildings, sewers, and sanitary matters.

LONDON SQUARES AND ENCLOSURES (PRESERVATION) BILL.—The London County Council have now deposited their printed Bill in the Private Bill Office of the House of Commons for the purpose of prohibiting the erection of buildings and structures on squares and enclosures, which in the preamble they state are necessary for recreation and the air spaces afforded by the lands are of great benefit to the health and well being of the inhabitants of the county. The Bill exempts all the scheduled land from assessment and rating on the basis of site value, and provides for the Council and the owners of such lands entering into agreements for their maintenance. Altogether 431 such spaces are scheduled, including the following well-known spots:—Clifford's-inn-gardens, Temple-gardens, Belgrave-square, Berkeley-square, Dean's-yard, Eaton-square, Eccleston-square, Grosvenor-square, Hanover-square, Whitehall-gardens, St. James'-square, Knightsbridge-green, Soho-square, Vincent-square, Prince's-garden, Belgrave-street, New Court, Cadogan-place, Cadogan-square, Carlyle-square, Han's-place, Cheyne-gardens, Burton-court, Sloane-square, Finsbury-square, Charterhouse-square, Bedford-square, Bloomsbury-square, Russell-square, Queen's-square, Gray's-inn Gardens, Lincoln's-inn-fields, Islington-green, Cromwell-gardens, Onslow-crescent, The Boltons, Harrington-gardens, Hyde Park-gate, Sussex-gardens, Westbourne-terrace, Lancaster-gate, Hyde Park-square, Paddington-green, Portman-square, etc.

ST. PAUL'S CHAPEL, GREAT PORTLAND-STREET.—A Bill has been deposited in the Private Bill Office of the House of Commons which provides for the demolition of St. Paul's Chapel, Great Portland-street, which was built under an Act of Parliament passed in the first year of the reign of William IV. The site is to be sold, and the stained-glass windows, organ, bells, tablets, monuments, and all other ornamental fittings and furniture disposed of by the Ecclesiastical Commissioners as they, with the consent of the Bishop of London, may determine.

ARCHITECTURAL WORK OF MUNICIPAL AUTHORITIES.—The Borough Councils of Paddington, Bermondsey, and Stoke Newington have decided to take no action in respect to a memorial from the Royal Institute of British Architects urging upon local governing authorities that architectural work be not placed in the hands of engineers and surveyors, and that, where the employment of a county or municipal official is deemed necessary, such official shall be required to have passed the qualifying examinations of the Royal Institute of British Architects.

TECHNICAL INSTRUCTION IN MALTA.—In his annual report on the affairs of Malta the Lieut.-Governor states that a technical and manual school, in which drawing, modelling in clay, plaster-casting, stucco-work, and wood-carving are taught, has been in existence for some years. The attendance is voluntary, and no fees are paid, and as the results obtained hardly justify the expenditure involved it has been decided to close the school as soon as some work which it has undertaken for a private individual is completed, and to develop the technical education which is given in the elementary schools.

CANTERBURY CATHEDRAL.—On December 18 the Archbishop of Canterbury unveiled the west window which has been set up in the Chapter House in memory of the late Dean Farrar, who, as Dean in 1895-1903, raised a sum of nearly 20,000*l.* for the reparation of the cathedral. The window, which illustrates events in the lives of past benefactors of the church, from the days of Augustine and Queen Bertha, was designed and executed by Mr. A. O. Hemming, of London, who was also the artist of the east window, presented by the Freemasons of Kent; and carried out the scheme for redecoration of the Chapter House.

BUILDING BY-LAWS.—At Lewes Petty Sessions, on Tuesday, at the conclusion of the ordinary business, Mr. W. W. Grantham made an application in connexion with the finding of the magistrates in the proceedings instituted by the Chailey Rural District Council against Mr. Justice Grantham for an alleged infringement of their building by-laws. Mr. Grantham, on behalf of Sir William Grantham, said he was instructed to apply to the Court for a copy of all the depositions, by-laws, and plans that were produced either in Court or before the magistrates during their deliberations, or for an inspection of the same. An inspection might simplify matters and save the expense of copies. The defendant had instructed him to say, in reference to the findings of the Bench, that he proposed to apply to the Court of King's Bench for a *certiorari* to send up all the proceedings to the High Court to be quashed on many grounds, and, if necessary, the defendant would apply for a *mandamus* to be presented to the magistrates of the Lewes Bench to dismiss the informations on the findings of the Bench.—Mr. Patrick, the Clerk to the Chailey Council, said the plans, by-laws, and correspondence had already been furnished in full to the defendant's representatives, and the magistrates' clerk's notes only remained. That could be very well left to the Bench. The District Council raised no objection, it being part of their policy to let the defendant's representatives have every possible information. The magistrates and their clerk consulted in private, after which Mr. Kemp said they felt unable to grant the application.

NEWCASTLE, ETC., BUILDING TRADE EMPLOYERS' ASSOCIATION.—The annual dinner of the Newcastle, Gateshead, and Tyne District of the Building Trade Employers' Association was held on the 20th inst. at the County Hotel, Newcastle. The chair was occupied by the President (Mr. W. T. Weir, of Howden). After the loyal toasts, Mr. S. Easten gave "The Mayors and Corporations of Newcastle, Gateshead, and Tyneside." Mr. Edge, City Engineer, responded on behalf of the Newcastle Corporation, and the Mayor of Gateshead also responded. Mr. T. Wilkinson, President of the Northern Counties' Federation of Building Trade Employers, proposed "The Newcastle, Gateshead, and Tyne District Branch of the Northern Counties' Federation of Building Trade Employers." He said Newcastle was one of the most important parts of their Federation, and they looked to that district for light and leading in connexion with all matters in the building trade. They had been organising the building trade in connexion with this Federation movement for six or seven years, and they had had a large measure of success, to which the Newcastle district had largely contributed. Not only did they deal with questions affecting the workmen, but they had come to a better understanding with the architects and surveyors under whom they worked. Ordinary people could not perhaps understand that the builders' business was not directly done with the clients themselves, but through a third party. So he was glad to say that their Federation had managed to bring about an agreement which would protect the rights of the builders, the architects, and the clients. The Chairman (Mr. W. T. Weir) responded. He said in Newcastle they had an association that made itself felt in their midst, and was unanimous in action. During the year their work had largely been of a routine character, but it had been none the less valuable. One of the things they had been aiming at was to ensure that their apprentice bricklayers should learn the technical side of their work—should learn in classes the practical manner of laying bricks. That object, he hoped, would be attained before another winter had passed. Another thing they hoped to see established was an association of foremen and clerks of works. Most of the foremen were in the men's associations, and he was certain that once they formed an association of their own, it would tend largely to assist architects and engineers in the carrying out of their designs. He went on to refer to the valuable evidence which had been given by representatives of the National Federation on the Royal Commission on trade picketing, which, he hoped, would tend to good all round. Mr. D. R. Brims gave "The Architects and Surveyors." Mr. Frank Caws responded on behalf of the architects. He thought the improvement in the relations between builder and architect was largely due to the surveyors. There was now much less room for difference of opinion than under the old haphazard style of doing things. They ought certainly to be grateful to the quantity surveyors for the excellent work they did. It certainly tended to narrow the ground of difference, and to promote a better feeling between architects and builders, and to make settlements much more easy and more just to all concerned. Mr. J. P. Allan replied on behalf of the surveyors. Mr. J. Bewley gave "The Allied Trades," which was responded to by the Sheriff of Newcastle.

WEIGHTS AND MEASURES.—In our number of October 31, 1903, we published an illustration of the official shape, as prescribed by an Order in Council, of the new standard weight of 50 lb., or "half-cental." That denomination was adopted in response to representations made by the Liverpool Incorporated Chamber of Commerce, the Mersey Docks and Harbour Board, and some local authorities. A recent Order in Council, fixing a fee of 3d. for the verification and stamping of weights of 50 lb., is appended to a report which has just been issued by the Board of Trade of proceedings of the Standards Department. The report sets forth that local authorities have generally adopted an official regulation authorising inspectors to verify and stamp the new weight, and that the Board have now reverified the standard measures of a chain of 100 links, or 66 ft. and 100 ft. respectively, laid down in 1881 at the National Gallery, Edinburgh, for use in testing measures employed in Scotland for the measurement of land, as also the end gauges at the National Physical Laboratory, and several weights and gauges used at the Royal Mint, Bank of England, Sheffield Assay Office, Goldsmiths' Hall, etc. During the past year eighty-five candidates obtained, upon examination, certificates of qualification, under the Act of 1889, as local inspectors of weights and measures.

CAPITAL AND LABOUR.

YORKSHIRE BUILDING TRADE.—In the new year representatives of the Leeds master builders and operatives will meet to consider the question of winter working hours. At Sheffield the employers have obtained a concession, the arrangement being that during the shortest time of winter employment the men will breakfast before commencing work, and will work from 8 a.m. to 4.30 p.m., with half an hour for dinner. The Leeds, Huddersfield, and York masters desire similar conditions to those in Sheffield. The basis of negotiations in Leeds will be a notice, served by the employers, upon the joiners and carpenters, and masons and bricklayers.

Legal.

CITY CHURCHES ARBITRATION.

THE case of the City and South London Railway Company *v.* the Rector and Churchwardens of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw and the Ecclesiastical Commissioners of England came before the House of Lords, composed of the Lord Chancellor and Lords Macnaghton, Lindley, and Robertson, on the 14th inst., on the appeal of the Company from a judgment of the Court of Appeal affirming a decision of the late Mr. Justice Wright as to the basis upon which compensation by the Company was to be paid on certain findings of the arbitrator. In 1893 the Company obtained an Act empowering them to purchase (for their undertaking) the site upon which the Church of St. Mary Woolnoth stands, and in March, 1896, they served notice to treat upon the rector and churchwardens for the purchase of the church and adjoining lands. The same year they deposited a Bill for an extension of time to construct the railway. The Bill was passed with the insertion of clauses designed to preserve the fabric of the church. By the terms of the Act the amount of purchase-money or compensation to be paid by the Company for the portion of so much of the surface as was not occupied by the church as should be occupied by them, and for the subsoil and crypt, and for the temporary occupation of the church, and all other matters of differences, were to be determined by arbitration. In 1900 Mr. R. Vigers was appointed arbitrator, and the most important questions he left for the Court were whether the compensation payable by the Company was to be assessed (1) upon the basis that all the lands taken were the site of the Church of St. Mary Woolnoth, and that the same could

never be used for any other purpose; or (2) upon the basis that, although the lands were at present *extra commercium*, they might, by Act of Parliament at some future time, become available for building, and that the arbitrator might draw his own conclusion as to when that time, if ever, would be likely to arrive; or (3) upon the basis that the site of the church and the rest of the land could immediately be made available for buildings other than a church. On basis (1) the sum payable was assessed at 90,628*l.*, on basis (2) at 136,421*l.*, and on basis (3) at 143,548*l.* Mr. Justice Wright decided that basis (2) was the true basis, and that decision was affirmed by the Court of Appeal. Hence the present appeal of the Company.

At the conclusion of the arguments of counsel the Lord Chancellor, in moving that the appeal should be dismissed, said he agreed with the judgment given in the Courts below. He thought the view taken by Mr. Justice Wright, that the true basis of compensation was that stated in finding (2) of the award, was correct.

The other noble and learned lords having concurred, the appeal was accordingly dismissed, with costs.

SANITARY DEFECTS IN TENEMENTS.

At Southwark Police Court recently, the National Model Dwellings Company, the owners of Queen's-buildings, Borough, were summoned before Mr. Cecil Chapman by the Southwark Borough Council for having failed to comply with notices requiring them to remedy certain sanitary defects in seven tenements. Mr. Corrie Grant appeared for the Borough Council, which was also represented by Canon Horsley, the Chairman of the Public Health Committee. Mr. B. R. Wyles, the general manager, appeared for the Company. Mr. Corrie Grant said that, during the eleven months ended December 3, the Borough Council had served 416 intimation notices on the Company requiring sanitary work to be done, and 320 only had been complied with. Queen's-buildings comprised over 600 tenements, with a population of about 3,000, and the Company kept one plumber only to do all the work. The notices were not complied with until weeks had expired, and generally the work was not begun until summonses were issued, as happened in the present case. The Borough Council had prosecuted the Company again and again, and they now asked the magistrate to impose such a penalty as to make it worth the while of the Company to do their duty by putting matters right, as soon as their attention was called to them. Mr. Wyles said that the Company were overloaded with notices, and were complying with them as rapidly as possible. Their staff on the premises numbered twenty-four, and included three plumbers. Evidence was given by Mr. Long, chief sanitary inspector, and Miss Elliott, sanitary inspector, that, in the present instances, the first notices were served in September or the early part of October, and the work was not done until December. In some instances the sanitary defects were very serious. Mr. Cecil Chapman said that several times their defaults had been brought to his notice, and he had brought pressure on himself to be lenient to them, because they were dealing with property partly on philanthropic ground, not intending to make large profits. But it seemed outrageous to continue that leniency when it was proved that some kind of cheeseparing policy led to positive neglect and danger to the sanitary condition of these tenements. The evidence disclosed gross neglect, and they would be fined the maximum penalty—10*l.* on each of the seven summonses —70*l.*, and 5*l.* 17s. costs.—*Times.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1,579 of 1904.—J. P. O'Donnell (O. M. Edwards): *Windows.*

A window consisting in the combination of a sash, means for holding the sash in the closed position, and automatic operating means mounted adjacent to and at one side of the plane of movement of the sash in opening and closing the window and connected with the sash, whereby a portion of the sash is enabled to pass by and beyond such means as the window is opened.

1,984 of 1904.—F. Hines, Ltd., and F. W. Freeman: *Chimney-Pots.*

A chimney-pot comprising a pot having a cam shaped projection formed thereon, and a base having a corresponding cam-shaped projection formed therein, the cam on the chimney-pot being adapted to be placed in the cam in the base, and turned in relation thereto so as to slide thereon, and with or without a wedge disposed between the steps of said cams, whereby the cams are forced or jammed together to form a tight joint and hold the chimney-pot securely in position.

2,174 of 1904.—J. Aradi: *Dismountable Buildings.*

Dismountable buildings whose wall units are composed of a wooden frame coated with artificial stone, consisting in the use in combination with the said wooden frame of a covering of perforated sheet metal to serve as a foundation for the latter of artificial stone.

2,310 of 1904.—G. Allan: *Pipe Joints.*

Jointing pipes by forming flanges on same, having angled surfaces, and compressing the flanges together by an annular cap or coupling ring, in two or more parts having an inner V-shaped groove, acting on the angled surfaces as the parts are drawn together by bolts and nuts.

6,665 of 1904.—W. W. Bannister, and W. J. Manning: *A Screen for Sifting Gravel and the like.*

The screen is made of triangle section steel blades, which are held in position at suitable distances by triangle-shaped compression clips. The size of mesh is formed, and the triangle-shape blades are secured by collars fitted on screwed rods, which pass through the ears of compression clips and are held together by nuts on outside of screen frame. The screen frame can be made of wood or metal.

13,824 of 1904.—J. Anderson: *Sash Fasteners.*

A sash lock consisting in the combination with a casting having a bolt guide way, and a drum receiving chamber, of a bolt in the guide way, a rotary drum in the chamber, means for rotating the drum, a pin on the bolt, and an inclined groove in the drum into which the pin enters.

16,438 of 1904.— H. E. Kenny: *Window Frames and Metal Weather Strips therefor.*

This consists in the combination with a window frame having a run-way thereon, and a sliding sash, of a series of rubbing projections in the base of the run-way against which the edge of the sash is adapted to engage, whereby the frictional contact between the sash and frame is reduced.

27,241 of 1903.—J. R. Little: *Fireproof Floors, Roofs, and like Structures.*

Fireproof floors and roofs constructed of hollow tubes or blocks placed side by side, and having the joints made water-tight and the end tubes closed to form water conduits or reservoirs.

23,067 of 1904.—H. H. Lake (C. H. Caspar): *A System of Ventilation.*

A system of ventilation for a building having a series of compartments or rooms, characterised by pipes leading up through the several rooms and provided with suitable inlets in the several rooms, an air space above the rooms, an exhauster arranged to withdraw the air from the room pipes and deliver it into the air space, and an auxiliary chamber in communication with the air space.

23,189 of 1904.—Eisenbahnsignal-Bauanstalt Max Judel & Co. (Aktiengesellschaft): *Devices for Measuring the Deflections of Girders or Rails.*

A device for measuring the deflections of rails or girders, comprising two or more superimposed rows of balls or rollers covered by a movable body, which balls or rollers are pushed apart by the pressure on a covering member by reason of the bending of the girder or rail, and thus cause an extension or prolongation of the row of balls or rollers which may be measured or recorded in any suitable manner.

23,282 of 1904.—F. G. S. Ham: *Ventilating Manhole Covers of Sewers and Drains.*

This consists in the employment of a closing tray in connexion with manhole covers of sewers and drains, said closing tray having a sunken channel or trough for receiving an annular lip on the underside of the manhole cover, to which the tray can be attached or connected by inserting projections thereon into slots in the cover and locking same by a turning movement.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.

December 14.—By Simmons & Sons (at Maidenhead).

Warfield, Berks.—"Honeywood Farm"; also "Malt Hill Field" and "Gentles Mead," 44 a. 3 r. 36 p., f. and c., y.r. 75*l.*	£1,730
Two freehold cottages and 14 acres	275
Bray, Berks.—"Staverton Lodge" and 5 a. 3 r. 25 p., f., y.r. 130*l.*	2,700
A freehold site, 5 a. 3 r. 8 p.	975

December 15.—By E. J. Carter & Knight, Frank & Rutley (at Maidstone).

Staplehurst, Kent.—"Maplehurst Mill" and 2 a. 2 r. 1 p., f.	700
"Rose Cottage Farm," 29 a. 1 r. 32 p., f.	910
"Fuller House" and 5 a. 3 r. 5 p., f.	760
"Monk's Farm," 24 a. 3 r. 15 p., f.	910
"Mathurst Farm," 122 a. 1 r. 17 p., f.	2,275
"Bletchingley," "Chapman's," and "Rabbit's" Farm; also "Birch Wood," 208 a. 3 r. 1 p., f.	4,000
"The Plain Tavern" and "Forstall Farm," 17 a. 3 r. 28 p., f.	2,750
Meadow and part of "Cockle Wood," 28 a. 1 r. 11 p., f.	340
"Saynden Farm," 194 a. 2 r. 29 p., f.	5,000
"Rock Cottage" and 3 a. 2 r. 6 p., f.	280
Thirteen freehold cottages	1,485

December 17.—By Dunn, Soman, & Coverdale (at Gloucester).

Westbury-on-Severn, Glos.—"Pinnock's Place Holding," 149 a. 3 r. 38 p., f., y.r. 120*l.*	2,850
"Wadmore Enclosures," 171 a. 3 r. 20 p., f., y.r. 102*l.* 18s. 4d.	2,250

December 20.—By Geo. Pratt.

Sydenham.—160, Sydenham-rd. (s.), u.t. 62 yrs., g.r. 12*l.*, e.r. 112*l.* 12s.	700
Sydenham-rd., a plot of land, area 1 a., u.t. 7 yrs., g.r. 26*l.*, p.	140

By J. A. & W. Tharp.

City of London.—12 and 13, Water-la., "Water House" (warehouse, offices, etc.), u.t. 72 yrs., g.r. 203*l.* 10s. 8d., e.r. 450*l.*	2,700

By Fleuret, Sons, & Adams (at Masons' Hall Tavern).

Strand.—Maiden-la., "The Bedford Head" p.h., u.t. 57½ yrs., y.r. 190*l.*, with Goodwill	9,200

By Rendell & Symons (at Totnes).

Halwell, Devon.—"Rowdens" and "Blackdown" Estates, 284 a. 2 r. 8 p., f.	2,700

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent: r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental: w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

Monday, January 2.

London Institution.—Mr. Eric S. Bruce, M.A., on "Balloons." 4 p.m.

Liverpool Architectural Society.—Mr. John Wilson on "The Palace of Versailles." Illustrated with Limelight Views. 6 p.m.

Tuesday, January 3.

Institute of Sanitary Engineers, Ltd. (*Lectures in Practical Sanitary Science*).—Mr. W. H. Maxwell on "Ventilation of Dwellings and Public Buildings." 7 p.m.

Wednesday, January 4.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

London Institution.—Mr. Eric S. Bruce, M.A., on "Airships." 4 p.m.

Friday, January 6.

Architectural Association.—Mr. A. Cox on "Libraries." 7.30 p.m.

London Institution.—Mr. Eric S. Bruce, M.A., on "Kites and Flying Machines." 4 p.m.

Saturday, January 7.

Junior Institution of Engineers.—Visit to the Voelker Incandescent Mantle Company's Factory, Albert Works, South-street, Wandsworth. 2.30 p.m.

The Incorporated British Institute of Certified Carpenters (*Carpenters' Hall*).—Mr. J. D. Manners on "A Visit to Chatham Naval Hospital." 6 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Designs and Plans for New Public Elementary School	C.B. of Preston	50*l.*, 30*l.*, and 20*l.*	Feb. 28
*New Elementary School, Aylesbury	Bucks Education Committee	50*l.* and 25*l.*	do.
*New Elementary School, Wolverton	do.	do.	do.
*New Secondary School, Wolverton	do.	do.	do.
*Designs for Municipal Buildings	Borough of Lambeth	No premiums are offered	Mar. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Two Hospitals at Workhouse, Horton-lane	Bradford Guardians	F. Holland, Engr. and Arch., 11, Parkinson's-chbrs., Bradford	Jan. 2
Secondary School, Penrose-road, Heiston	Cornwall Education Committee	Public Buildings, Wendron-street, Helston	do.
Road Materials	Paddington Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	do.
Joiners', etc., Work, Enlargement of Central Offices	Bradford Guardians	Empsall & Clarkson, Architects, 7, Exchange, Bradford	Jan. 3
Waterworks Extension	Chippenham U.D.C.	A. E. Adams, Engineer, High-street, Chippenham, Wilts.	do.
Stoneware Pipes for One Year	Chepping Wycombe Corporation	T. J. Rushbrooke, Borough Surveyor, Chepping Wycombe	do.
Two Blocks of Latrines at Knutsford Workhouse	Bucklow Guardians	R. J. McBeath, Architect, Birnam House, Sale	do.
Parapet, Wall, etc., Springburn Park	Glasgow Corporation	J. G. Monro, Town Clerk, City-chambers, Glasgow	do.
Extension of Timber Storage Depot at Shieldhall	Clyde Navigation Trustees	W. M. Alston, Engineer, 16, Robertson-street, Glasgow	do.
Pit Wood for Colliery Uses	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	do.
Paving, etc., 29 Streets in Broughton & Pendleton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Stores	Halifax Gasworks Committee	J. Wilkinson, Engineer, Gas Works, Halifax	Jan. 4
Additions to Grove Mills, Ingrow, Keighley	Chiswick U.D.C.	Moore & Crabtree, Architects, York-chambers, Keighley	do.
Two Slop Vans and Two Slop Carts	Glasgow Corporation	J. Barclay, Surveyor, Town Hall, Chiswick	do.
Heating Apparatus, Premises at corner of Trongate	do.	Thomson & Sandilands, Architects, 241, West George-st., Glasgow	Jan. 5
Heating Apparatus, Premises, Albion-street	Leeds Corporation	do.	do.
Paving and Flagging Streets	Whickham U.D.C.	City Engineer's Office, Municipal-buildings, Leeds	do.
280 lineal yds. of Creosoted Fencing	do.	J. B. Renton, Surveyor to Council, Whickham	Jan. 6
Wire Fencing at Hill of Garmouth, N.B.	do.	Wink & Mackenzie, Solicitors, Elgin	do.
A Cottage	Harrow-on-the-Hill U.D.C.	Mr. Adams, Moore, Harberton, Totnes	Jan. 7
Making-up Fairholme-road	Bury, etc., Joint Water Board	J. P. Bennetts, Engineer to Council, Harrow-on-the-Hill	do.
1,320 tons 12-in. Cast-Iron Pipes & 50 tons Castings	do.	J. Cartwright, Engineer, 29, Old Queen-street, Westminster, S.W.	do.
550 tons of Cast-Iron Pipes and 30 tons Castings	do.	do.	do.
940 tons 15-in. Cast-Iron Pipes and 40 tons Castings	Southampton Corporation	do.	do.
Ten Cottages, Simnel-street	Guildford, etc., Joint Hospital Bd.	C. J. Hair, Architect, 23, Portland-street, Southampton	Jan. 9
Scarlet-Fever Pavilion, etc., Woodbridge	Lewisham Borough Council	E. L. Lunn, Architect, 36, High-street, Guildford	do.
Kerbing, Paving, etc., Works	do.	E. Wright, Town Hall, Catford	do.
Wood-paving Works, Thurston-road	Dartford Guardians	do.	do.
60 Fathoms Baltic Yellow Deal Batten Ends	Saddleworth U.D.C.	J. C. Hayward, Union Offices, Dartford, Kent	do.
Materials for Road Repairs	Stockport Corporation	Surveyor, Council Offices, Uppermill, near Oldham	do.
Rails, etc., for Tramways	Southampton Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Storm-water Sewer	Commrs. of Public Works, Ireland	Borough Engineer's Office, Southampton	Jan. 10
Plumbing, etc., Works	Belfast Corporation	H. Williams, Sec., Office of Public Works, Dublin	do.
A System of Synchronised Dials at New City Hall	do.	A. B. Thomas, Architect, 5, Queen Anne's-gate, Westminster, S.W.	do.
Electric Service Lifts at New City Hall	Mrs. Dickson	do.	do.
Additions, etc., to Tullaghan House, Bundoran	Chippenham U.D.C.	T. Elliott, Architect, 37, Darling-street, Enniskillen	do.
2,916 yds. of 7-in. Cast-Iron Pipes	do.	A. E. Adams, Engineer, High-street, Chippenham, Wilts	do.
3,210 yds. of 6-in. Cast-Iron Pipes	do.	do.	do.
High Level Service Reservoir, etc.	No. 2 Bedlinog Building Club	do.	do.
Sixteen Houses on Bedlinog Farm	Borough of Bromley	"Fox and Hounds," Bedlinog	do.
*Street Improvements	Meadow Bank Council Sch. Managers	Borough Engineer, Municipal Offices, Bromley, Kent	Jan. 11
Alterations to School, Winsford	Rathdown No. 2 R.D.C.	J. H. Cooke, Russell-street, Winsford	do.
Sewerage, etc., Works, Greystones, co. Wicklow	Islington Borough Council	R. M. Butler, Engineer, 22, Nassau-street, Dublin	do.
Steel Water Storage Tank for 250,000 gallons	do.	J. Patten Barber, Borough Engineer, Town Hall, Upper-street, N.	do.
Cast-Iron Pumping Mains, etc., Hornsey-road Baths	Wimbledon Education Committee	do.	do.
*School and Cookery Centre	Edmonton Union	The Clerk, Council Offices, Wimbledon, S.W.	do.
*Day Room at Enfield Workhouse	Chiswick U.D.C.	T. E. Knightley, 106, Cannon-street, E.C.	Jan. 13
Houses for Working Classes	Banbury Town Council	J. Barclay, Surveyor, Town Hall, Chiswick	Jan. 14
Nine Houses, Condercum-road, Benwell	Dover Town Council	Farthing & Dunn's Office, 13, Shakespeare-st., Benwell, Newcastle	do.
Hartshill Stone for One Year	Devonport Guardians	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	Jan. 16
1½ miles of Double-Line Light Railway	Coventry Corporation Gas Com.	Borough Engineer, Maison Dieu House, Dover	do.
Passenger Lift to Workhouse Infirmary	Fulham Borough Council	H. G. Luff, Architect, 64A, Chapel-street, Devonport	do.
*Valve House, etc., at Foleshill Works	Croydon R.D.C.	Engineer and General Manager, Gas Works, Coventry	Jan. 18
Brick Chimney Shaft, Townmead-road Wharf	do.	F. Wood, Borough Surveyor, Town Hall, Fulham	do.
*Erection of Cottage, etc., at Wallington	Borough of Fulham	Robert Masters Chart, Surveyor, Union Bank-chbrs., Croydon, S.E.	do.
*Erection of Office, etc., at Merton	Essex C.C.	do.	do.
*Making-up Ellerby-street	Commissioners H.M. Works	Borough Surveyor, Town Hall, Fulham, S.W.	Jan. 19
*Conversion of Town Hall into Police Station	Yeovil R.D.C.	County Architect, Duke-street, Chelmsford	Jan. 20
*New Post Office at Rotherham	Ludlow Corporation	H.M. Office of Works, Storey's-gate, London, S.W.	Jan. 21
Martock Sewerage and Sewage Disposal	Hailsham R.D.C.	A. J. Martin, Engineer, 7, Victoria-street, Westminster	do.
Sewerage Scheme	Hastings Corporation	J. H. Williams, Town Clerk, Ludlow	do.
Road Materials and Cartage	Tendring Guardians	E. Catt, 17, London-road, Hailsham	Jan. 23
70 yds. of Cast-Iron Socket Pipes	Johannesburg Municipal Tramways	P. H. Palmer, Borough Engineer, Town Hall, Hastings	Jan. 24
Tendring Workhouse Sewage Disposal	Sowerby Bridge U.D.C.	A. J. Martin, Engineer, 7, Victoria-street, Westminster, S.W.	Jan. 26
Vignoles Rails, Fishplates, etc.	New Windsor Corporation	Mordey & Dawbarn, Engineer, 82, Victoria-st., Westminster, S.W.	Jan. 28
Sewage Disposal Works	Commrs. of Public Works, Ireland	C. L. Whitehead, C.E., Holling's Mill-lane, Sowerby Bridge, Yorks.	Jan. 30
New Main Sewer (951 lineal yds.)	do.	Borough Surveyor, Windsor	Feb. 11
Works at Downies Bay, co. Donegal	do.	H. Williams, Sec., Office of Public Works, Dublin	No date.
Stabling at the Grapes Inn, Keighley	do.	W. Jackson, Architect, Tanfield-chambers, Bradford	do.
Plumb. Work of 6 Hses. in Hinchcliffe-st., Bradford	Mr. E. Frost	W. Barrand, Carlton-street, Bradford	do.
Organ for Hemingbrough Church		Banks, Hemingbrough Hall, Howden, Yorks.	do.
Alters., etc., to 2 Shops, etc., Trentham-rd., Longton		W. Wood, Architect, Longton, Staffs.	

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Correspondence and Gen. Clerk (Boro' Engr's. Dept.)	Hackney Borough Council	120*l.* per annum	Jan. 3
*Headmaster	City of Sheffield Education Com.	500*l.* per annum	Jan. 18

Those marked with an asterisk (*) are advertised in this number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvii.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 12 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 8 0	" " "
Facing Stocks ...	2 5 0	" " "
Shippers	2 5 0	" " "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts ...	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ...	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks.....	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats.....	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers...	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats.....	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers...	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	less than best.

	s. d.	
Thames and Pit Sand.....	7 0	per yard, delivered.
Thames Ballast.....	6 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks...	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube. "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

	s. d.	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "

SLATES (*continued*).

in. in.	£ s. d.	
20 × 10 best Eureka unfading green .	15 17 6	per 1000 of 1200 at r. d.
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles .	42	0 per 1000 at rly. depôt.
Hip and Valley tiles ...	3	7 per doz. " "
Best Broseley tiles.....	50	0 per 1000 " "
Do. Ornamental tiles	52	6 " " "
Hip and Valley tiles ...	4	0 per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6 per 1000 " "
Do. Ornamental do	60	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	0 " " "
Best Red or Mottled Staffordshire do. (Peakes).....	51	9 per 1000 " "
Do. Ornamental do.....	54	6 " " "
Hip tiles	4	1 per doz. " "
Valley tiles	3	8 " " "
Best "Rosemary" brand plain tiles.....	48	0 per 1000 " "
Best Ornamental tiles	50	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	8 " " "
Best "Hartshill" brand plain tiles, sand faced.	50	0 per 1000 " "
Do. pressed.....	47	6 " " "
Do. Ornamental do	50	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	6 " " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 16 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less thn best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in by 11 in.....	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals.....	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards.
Oddments	28 0 0	"
Seconds, regular sizes.....	30 0 0	"
Yellow Pine oddments	25 0 0	"
Kauri Pine—Planks, per ft. cube .	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0 0 9	0 1 0
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks, per ft. cube.....	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 13 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6

WOOD (*continued*).

Prepared Flooring (*continued*)—	Per square. £ s. d.	£ s. d.
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 0
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	5 15 0 ...	6 15 0
Compound Girders, ordinary sections	7 12 6 ...	8 15 0
Angles, Tees and Channels, ordinary sections	7 7 6 ...	8 7 6
Flitch Plates	7 15 0 ...	8 5 0
Cast Iron Columns and Stanchions including ordinary patterns	6 12 6 ...	7 15 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	6 15 0 ...	7 5 0
Staffordshire Crown Bars, good merchant quality.....	7 5 0 ...	7 15 0
Staffordshire "Marked Bars"	9 10 0 ...	—
Mild Steel Bars.....	8 5 0 ...	8 15 0
Hoop Iron, basis price	8 15 0 ...	9 0 0
" " Galvanized	16 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron, Black—		
Ordinary sizes to 20 g.	9 0 0 ...	—
" " 24 g.	10 0 0 ...	—
" " 26 g.	11 15 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.....	12 0 0 ...	—
Ordinary sizes to 22 g. and 24 g.	12 10 0 ...	—
" " 26 g.	13 10 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	15 0 0 ...	—
" " 22 g. and 24 g.	15 10 0 ...	—
" " 26 g.	17 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 0 0 ...	—
" " 22 g. and 24 g.	12 10 0 ...	—
" " 26 g.	13 5 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 0 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 0 0 ...	—
" " " 26 g.....	13 5 0 ...	—
Cut nails, 3 in. to 6 in.....	8 10 0 ...	9 0 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	15 7 6 ...	—
Pipe in coils	15 17 6 ...	—
Soil pipe	18 7 6 ...	—
Compo pipe.....	18 7 6 ...	—
ZINC—Sheet—		
Vieille Montagne .....ton	30 15 0 ...	—
Silesian.....	30 10 0 ...	—
COPPER—		
Strong Sheet.....per lb.	0 0 10 ...	—
Thin " ..... "	0 0 11 ...	—
Copper nails ..... "	0 0 10 ...	—
BRASS—		
Strong Sheet..... "	0 0 9½ ...	—
Thin " ..... "	0 0 10 ...	—
TIN—English Ingots ..... "	0 1 4½ ...	—
SOLDER—Plumbers' ..... "	0 0 6½ ...	—
Tinmen's..... "	0 0 8 ...	—
Blowpipe..... "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d.	per ft. delivered.
" fourths.....	2d.	" "
21 oz. thirds	3¾d.	" "
" fourths.....	3d.	" "
26 oz. thirds	4¾d.	" "
" fourths.....	3¾d.	" "
32 oz. thirds	5¾d.	" "
" fourths.....	5d.	" "
Fluted Sheet, 15 oz.....	3¾d.	" "
" 21 oz.....	4¾d.	" "
⅛ Hartley's Rolled Plate	2d.	" "
7/32 " " "	2¼d.	" "
¼ " " "	2½d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 5
" " " in barrels	"	0 1 6
" " " in drums.....	"	0 1 8
Boiled " " in pipes	"	0 1 7
" " " in barrels	"	0 1 8
" " " in drums.....	"	0 1 10
Turpentine, in barrels	"	0 3 4
" in drums.....	"	0 3 6
Genuine Ground English White Lead	per ton	19 15 0
Red Lead, Dry	"	19 5 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak.....	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage.....	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper.....	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan.....	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALDERSHOT.—For a 9-in. sewer in Church-road, and 12-in. and 9-in. surface-water drains in North-lane, for the Urban District Council. Mr. F. C. Uren, C.E., Municipal-buildings, Aldershot:—

For Church-road Sewer.

Cunningham, Forbes, & Co., Fleet, Hants £139 10 10

Surface-water Drainage.

W. Norris, Upper Hale, Farnham, Surrey 245 0 0

BUCKIE (Scotland).—Accepted for erecting a villa at High-street, Buckie, for Mr. D. McGregor, jeweller. Mr. J. D. Geddes, architect, East Church-street, Buckie:—

Mason: J. Dawson, Buckie	£233	3	8
Carpenters: W. Geddes & Sons, Portessie	148	5	0
Slater: J. Barclay, Buckie	30	17	0
Plumbers: J. & T. Campbell, Buckie	51	18	0
Plasterer: R. Hume, Buckie	43	6	5
Ironwork: Glegg & Thomson, Aberdeen	4	4	2
Painter: R. Johnston, Bridgend	15	0	0

CORK.—For erecting a Town Hall, Albert Quay, for the Town Council. Mr. J. F. Delany, City Engineer. Quantities by Engineer:—

J. Delany & Co., 25, Henry-street, Cork .. £1,300

DUBLIN.—For central fire brigade station, Great Brunswick-street and Tara-street, for the Corporation. Mr. C. J. M'Carthy, City Architect, Municipal-buildings, Dublin:—

P. J. Byrne & Son	£20,345	0	J. Pemberton & Son	£18,158	0
J. P. Pile	19,700	0	H. & J. Martin	17,599	11
J. & F. Pemberton	19,430	0	J. & P. Good	17,499	0
H. J. Monks	19,000	0	J. & W. Stewart	16,684	0
W. Conolly	18,643	0	J. Donovan & Son‡	16,450	0
Collen Bros., Ltd.	18,500	0			

‡ Recommended for acceptance.

LONDON.—Accepted for making-up roadway and paving footways of Woodlawn-road, section 2, for Fulham Borough Council. Mr. Francis Wood, Borough Surveyor. Town Hall, Fulham, S.W.:—

H. J. Greenham £629

[The Borough Surveyor's tender for paving the footways of Woodlawn-road, section 2, for the sum of £236 has also been accepted.]

LONDON.—For the rebuilding of 30 and 32, Whitfield-street, for Messrs. Catesby & Sons, in connexion with their present premises in Tottenham Court-road, *etc.* Mr. Hy. A. Whitburn, architect, 22, Surrey-street, W.C., and Woking. Quantities by Mr. J. T. Carew, surveyor, 22, Surrey-street:—

		Credit for old materials.
H. Burman & Sons	£5,481	£97
J. Carmichael	5,430	50
D. Prosser	5,397	—
Mattock & Parsons	5,289	30
Patman & Fotheringham	5,153	120
Smith & Sons	5,015	30
Martin Wells	4,975	—
H. M. Dove	4,970	—
T. Sobey, 34, Lamb's Conduit-street*	4,934	50
Mattock Bros.	4,909	—

LONDON.—For building a nurses' home at the Infirmary, Bancroft-road, Mile End-road, E., for the Guardians of Mile End Old Town. Mr. J. M. Knight, architect, 35, Bancroft-road, Mile End-road, E. Quantities by architect:—

E. Jackson	£8,959	J. Calcutt	£7,687
F. & F. J. Woods	8,773	A. Symes	7,619
J. Gibbs	8,765	W. A. Barker, Forest Gate*	7,536
Perry & Co.	8,199	T. Almond & Sons	7,400
Turnbull & Son	8,050	W. Gladding	7,398
W. Johnson & Co.	7,995	Harris & Wardrop	7,859
E. Lawrence & Sons	7,395	W. Yates	7,787
T. Pearce	7,276		

MACCLESFIELD.—For new water main at the Workhouse, for the Guardians:—

J. Clayton, Macclesfield £227

PLYMOUTH.—For erecting two blocks of dwellings at Prince Rock, for the Corporation. Messrs. Hine & Odgers, architects, Lockyer-street, Plymouth:—

S. Roberts, Grand Parade-road, Plymouth £4,399

[Accepted subject to certain deductions to be agreed between architects and contractor.]

PONTYPOOL.—For rebuilding the Ship Hotel, Crane-street, for Messrs. W. Hancock & Co., Ltd. Messrs. Johnson & Hutchins, architects, Risca. Quantities by architects:—

J. Edwards & Son	£999 0	E. C. Jordan	£906 0
Knowler & Herbert	985 0	Leadbeter Bros., Newport, Mon.*	899 0
C. H. Reed	950 0	J. Jenkins, withdrawn	825 0
J. Partridge	947 10		
J. Charles	933 0		

PORTLAND.—For erecting Collin's shelter and ladies' lavatory in Victoria Gardens, Fortune's Well, for the Urban District Council. Mr. R. Stevenson Henshaw, Engineer and Surveyor, Council Offices, New-road, Portland:—

J. T. Whettam, jun.	£350 0	Jesty & Baker, Castletown, Portland*	£209 0
A. J. Dunford	285 17		
Wakeham Bros.	255 0		

[Engineer's estimate, £220.]

SOUTHEND-ON-SEA.—For making-up a roadway in continuation of Occupation-road, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend-on-Sea:—

G. Bell	£4,942 11 6	J. C. Flaxman, Southend*	£3,980 0 0
W. Iles	4,250 0 0		
Buxton & Jenner	4,145 12 7		

[Surveyor's protecting estimate, £4,200.]

TAYNUILT.—For building a constable's house, for the County Council of Argyll. Mr. G. Woulfe Brenan, C.E., Albany-street, Oban:—

P. Wright	£408 0	D. & A. Munn	£342 15
H. Macdougall	374 12	J. Rowan, Appin*	343 5

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